Contents—Sept. 1941

Volume XXII No. 9

ARCHIVES OF PHYSICAL THERAPY

Suite 418 — 30 North Michigan Avenue, Chicago, Illinois

Original contributions, exchanges and books for review should be forwarded to the Editorial Office. All business matters including advertising should be handled through the Executive Office, Suite 418 — 30 N. Michigan Ave., Chicago, Illinois. The statements in the manuscripts published in the ARCHIVES OF PHYSICAL THERAPY, are made solely on the responsibility of the author. The American Congress of Physical Therapy does not assume any responsibility for statements contained therein. Manuscripts accepted for publication in ARCHIVES OF PHYSICAL THERAPY, are for exclusive publication and may not be published elsewhere.

▼

OFFICERS

American Congress of Physical Therapy

A. R. HOLLENDER, M.D.,
Miami Beach, Fla., President.
FRED B. MOOR, M.D.,
Los Angeles, President-Elect.
KRISTIAN G. HANSSON, M.D.,
New York, First Vice-President.
MILAND E. KNAPP, M.D.,
Minneapolis, Second Vice-President.
WALTER S. McCLELLAN, M.D.,
Saratoga Springs, N. Y.,
Third Vice-President.
H. WORLEY KENDELL, M.D.,
Dayton, Ohio, Fourth Vice-President.
KENNETH PHILLIPS, M.D.,
Miami, Fla., Fifth Vice-President.
RICHARD KOVACS, M.D.,
New York, Secretary.
JOHN S. COULTER, M.D.,
Chicago, Treasurer.
WALTER J. ZEITER, M.D.,
Cleveland, Executive Director.
MARION G. SMITH, B.Sc.,
Chicago, Executive Secretary.

EXECUTIVE COUNCIL

Nathan H. Polmer, M.D., New Orleans, *Chairman.*
Norman E. Titus, M.D., New York, *Secretary.*
William Bierman, M.D., New York.
John Stanley Coulter, M.D., Chicago.
James C. Elsom, M.D., Madison, Wisconsin.
Frank H. Ewerhardt, M.D., St. Louis, Mo.
Roy W. Fouts, M.D., Omaha.
John Severy Hibben, M.D., Pasadena.
Dsrael Kobak, M.D., Chicago.
Gustav Kolischer, M.D., Chicago.
Frank H. Krusen, M.D., Rochester, Minn.
Nathan H. Polmer, M.D., New Orleans, La.
Albert Frank Tyler, M.D., Omaha.
Frederick L. Wahrer, M.D., Marshalltown, Iowa.
A. R. Hollender, M.D., Miami Beach, Fla., Ex-Officio.

EDITOR EMERITUS

DISRAELI KOBAK, M.D.,
Chicago.

▼

Subscriptions — In the United States, its possessions, and Mexico, $5.00 yearly; Canada, $5.50; elsewhere, $6.50 the year.

Advertising rates on application. All advertising copy subject to acceptance by publication committee.

Published monthly at Chicago, Illinois, by American Congress of Physical Therapy.

Entered as Second Class Matter January 29, 1938, at the Post Office at Chicago, Illinois, under the Act of March 3, 1879.

ORIGINAL ARTICLES

Further Studies in Manipulative Treatment of Backache ..... Frederick A. Jostes, M.D. 515

Physical Therapy in Relation to Dermatology. A Résumé ..... Anthony C. Cipollaro, M.D. 525

Methods of Applying Heat Locally in General Practice ..... Frank H. Krusen, M.D. 531

The Contributions of Physical Medicine to the Art of Healing ..... A. R. Hollender, M.D. 540

Physical Therapy in Relation to Surgery ..... Herbert E. Hipps, M.D., and Billie Louise Crook, R.P.T.T. 545

•

SPECIAL ARTICLE

Awards of Merit by the American Congress of Physical Therapy for the Year 1941 550

•

Editorials 551

•

Medical News 559

•

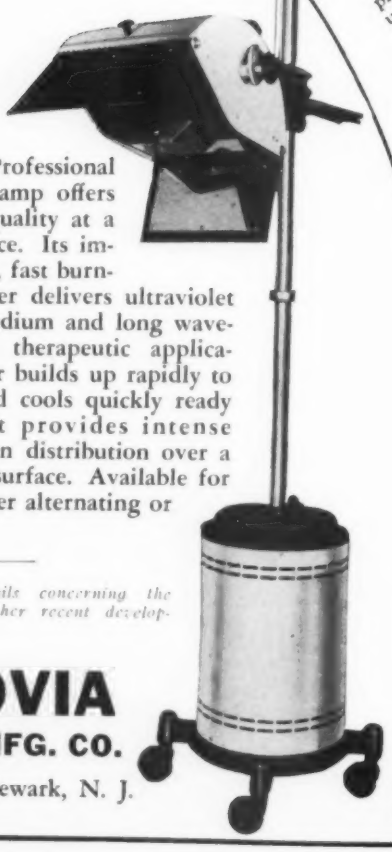
Book Reviews 564

•

Physical Therapy Abstracts 567

NOTE THESE *Extraordinary Features* OF THE *New* LUXOR "S" ALPINE ULTRAVIOLET LAMP

NON-TILTING . . . FAST ACTING
UNUSUALLY EFFECTIVE . . ECONOMICAL
SIMPLE OPERATION
LOW PURCHASE PRICE
BEAUTIFUL DESIGN



The Luxor "S" Professional Model Alpine Lamp offers unusually high quality at a low purchase price. Its improved no tilting, fast burning, quartz burner delivers ultraviolet rays of short, medium and long wavelengths, for all therapeutic applications. The burner builds up rapidly to full intensity, and cools quickly ready for relighting. It provides intense radiation and even distribution over a wide shadowless surface. Available for operation on either alternating or direct current.

Write for full details concerning the LUXOR "S" and other recent developments

HANOVIA
CHEM. & MFG. CO.
Dept. 306-I Newark, N. J.

IT HAS A WIDE RANGE OF CLINICAL USEFULNESS

Skin Diseases: Ultra-violet radiation acts specifically on lupus vulgaris and often has a beneficial effect in such conditions as acne vulgaris, eczema, psoriasis, pityriasis rosea and indolent ulcers.

Surgery: Sluggish wounds that do not heal or are abnormally slow in healing may respond favorably to local or general irradiation.

Care of Infants and Children: The phrophylactic and curative effects of ultra-violet radiation on rickets, infantile tetany or spasmophilia, and osteomalacia are well known

Pregnant and Nursing Mothers: Prenatal irradiation of the mother, and also irradiation of the nursing mother, have a definite preventive influence on rickets

Tuberculosis: Irradiation is of distinct value for patients suffering from tuberculosis of the bones, articulations, peritoneum intestine, larnyx and lymph nodes, or from tuberculous sinuses

Other Applications: As an adjuvant in the treatment of secondary anemia, irradiation merits consideration. Also exposure of the lesions of erysipelas and a wide area of surrounding tissue has been shown to have a favorable effect

FURTHER STUDIES IN MANIPULATIVE TREATMENT OF BACKACHE *

FREDERICK A. JOSTES, M.D.

Assistant Professor of Clinical Orthopedic Surgery, Washington University School of Medicine

ST. LOUIS, MISSOURI

When manipulative therapy is considered in reference to backache, the practical value of the procedure may be evaluated by analyzing its effects on various types of lesions of the back. In answering the initial question as to what conditions manipulation may be used for, the following conditions which have been enumerated in a previous publication,[1] might be included: "the anatomical variations (sacralization, impinging transverse processes, etc.), congenital anomalies, poor posture (contraction of tensor fasciae latae, marked lordosis, etc.), dislocations (spondylolisthesis, apophyseal subluxation, etc.), fasciitis and myofascial syndromes, and sprains (acute or chronic) of traumatic etiology. In all the foregoing conditions, the element of sprain plays an important role,—whether it has been the result either of a direct traumatic incident or, because of impaired body mechanics, of a kind of trauma active over an extended period of time." A critical survey will be made of various groups of conditions which respond in similar manner.

Group 1. Conditions Responding to Manipulation With Immediate Relief and Correction

Acute sacroiliac and lumbosacral strains respond satisfactorily to manipulative treatment. Generally the diagnosis is strongly suggested by the history; the traumatic incident is definite; often there have been no previous episodes of low back pain. The clinical picture is characteristic: Since the onset of pain the patient may have been locked in a position of forward flexion and lateral inclination or list of the spine accompanied by an acute pain in the lower part of the back perhaps radiating down the thigh. Localized tenderness is situated over the affected joint, whether it is lumbosacral or sacroiliac.

Illustration. — A junior medical student came in complaining of an acute backache. He was tall, of good muscular development and apparently in good physical condition except for his present incapacitation. His history indicated the previous afternoon while chopping wood, he was seized with a sharp pain in the lower part of the back, as he went through the rotary flexion movement of swinging the axe downward. He was immediately unable to extend his spine completely and had since assumed a posture with a marked listing to the left. Shortly after the onset he was conscious of pain radiating down his right thigh along the distribution of the sciatic nerve. Physical examination showed a list of the trunk to the left and tautness of the right paravertebral muscles. The right posterior-superior spine was slightly higher than the left. The right knee was partially flexed, and the patient could extend it only at the cost of increasing the sciatic pain. There was no visible or measurable atrophy of the right thigh or calf muscles. There was no palpable tenderness along the various spinous processes or interspinous ligaments. The lumbosacral joint was not sensitive to pressure. The right sacrospinalis muscle and right iliolumbar ligament were painful to moderate pressure. The point of greatest tenderness was over the area of the right sacroiliac joint. An effort to bend forward while keeping the

* From Department of Surgery, Washington University School of Medicine.
* Read at the Nineteenth Annual Session of the American Congress of Physical Therapy, Cleveland, Ohio, September 3, 1940.

knees extended was immediately inhibited by acute pain, which the patient localized in the region of the right sacroiliac joint. In the sitting position he could flex his spine more readily, although the list to the left persisted. Straight leg raising on the right was possible to only about 20 degrees without pain in the region of the right sacroiliac joint. Straight leg raising on the left to 85 degrees caused contralateral pain, that is pain on the right side in the region of the sacroiliac joint. The knee jerk and ankle jerk on the right side were normally active. Sensory tests for pain and temperature revealed nothing abnormal.

The patient's general health had been excellent, and review by systems revealed no conditions which might have given rise to a symptomatic backache. There had been no previous attacks. The onset was associated with a definite act involving physical exertion, yet this was voluntary and not especially drastic or forcible. He presented the typical picture of a low back syndrome. All signs

Fig. 1. — Massage of the gluteal muscles is begun carefully and gently, the patient meanwhile being induced to relax as completely as possible. When the pelvis begins to roll more easily from side to side with the gentle massage, the deeper kneading, which eventually includes the areas of tenderness and pain, is begun. From the pelvis, the course of massage proceeds to the paravertebral areas and finally to the mid-thoracic region, so that the shoulder girdles are likewise brought into a state of as complete relaxation as is possible. This procedure is eminently successful in securing satisfactory preliminary relaxation in most cases.

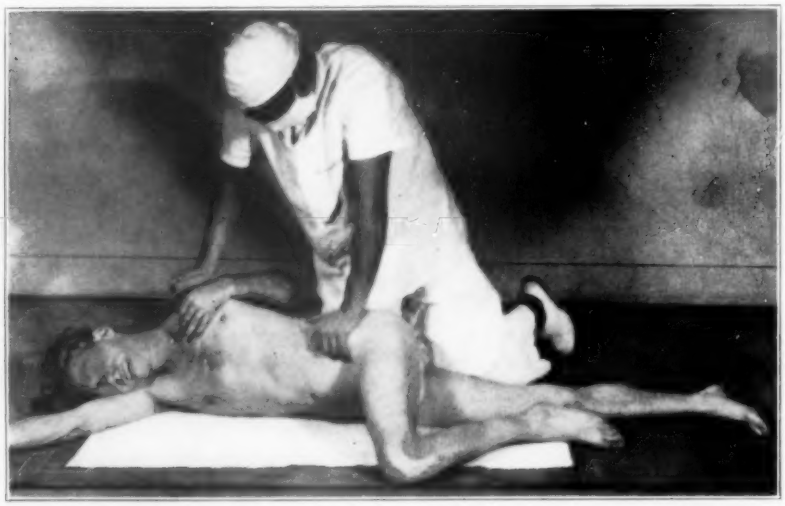


Fig. 2. — Maneuver No. 1. The patient is taken from the prone position, following deep muscle massage, and is placed on his right side. The right knee and hip are extended fully. The left knee and hip are flexed. The left hand is placed over the left pectoral region. This position is arranged by the manipulator. Next the manipulator with his left hand grasps the left ilium firmly in the region of the anterior superior spine and holds the left shoulder with his right hand. He then executes a rotary or torsion movement, bringing the patient's shoulder backward and at the same time thrusting the ilium forward and downward.

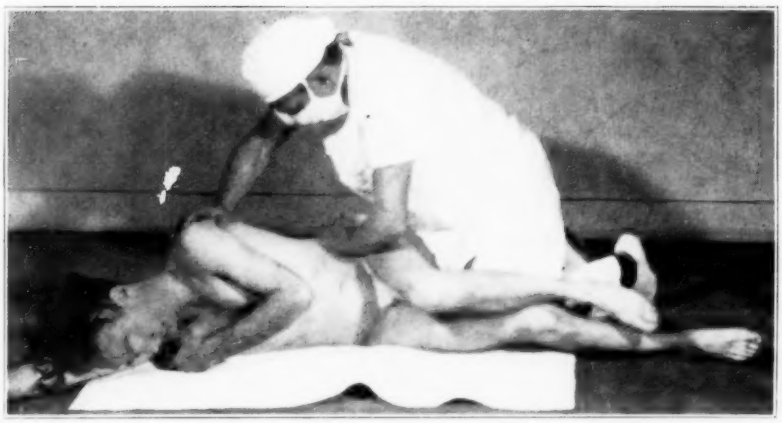


Fig. 3. — Maneuver No. 2. The patient maintains the position as in Maneuver 1. The manipulator then reverses the movement bringing the shoulder forward and thrusting the left ilium backward and upward. The position of patient is then reversed, being placed on his opposite side. Maneuvers No. 1 and No. 2 are then repeated.

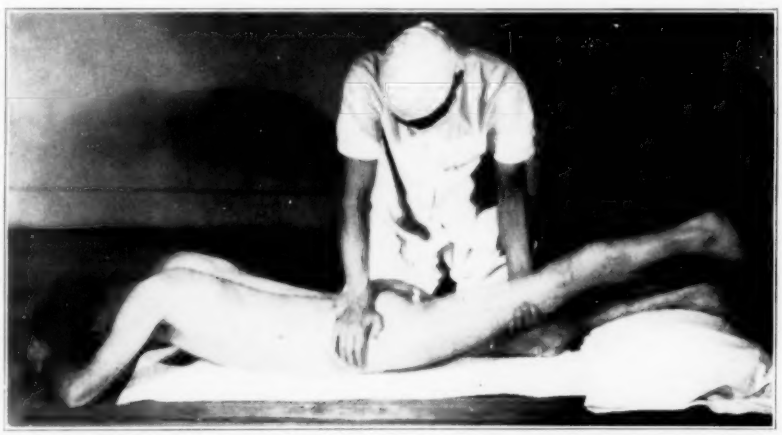


Fig. 4. — Maneuver No. 3. The patient assumes the prone position. The manipulator then places his right hand forcefully over the left gluteus maximus, being careful not to bridge the sacro-iliac joint. He then hyperextends the patient's left thigh with his left hand (care being taken that the knee is extended. This usually produces severe pain on the involved side, especially if there is a contracted tensor fasciae latae present. At times the response is more painful if the manipulator's right hand presses down on the sacrum only, while the leg is being hyperextended. This is apparently the result of increased leverage on the sacro-iliac joint.

pointed toward abnormal sensitivity and palpable tenderness about the right sacroiliac joint. There was sciatic irritation, but the neurologic examination gave negative results. The roentgenograms showed nothing abnormal in the bones and, apparently, no pathologic change in the intervertebral disks.

With this data, it was reasonable to favor the tentative diagnosis of acute low back strain involving the ligaments and contiguous muscles of the right sacroiliac joint accompanied by reflex irritation of the right sciatic nerve. The test for such a diagnosis lies in the response of the lesion to conservative therapy. The patient was manipulated without anesthesia with his full cooperation so far as voluntary or self-induced relaxation is concerned. Figures 1 to 8 demonstrate the manipulative technic.[2] He obtained immediate relief from the acute pain. As is characteristic with this type of lesion, he sensed a readjustment or realinement of structures which previously had given him the feeling of impingement. With the acute pain subsided and the muscle spasm lessened, he moved about

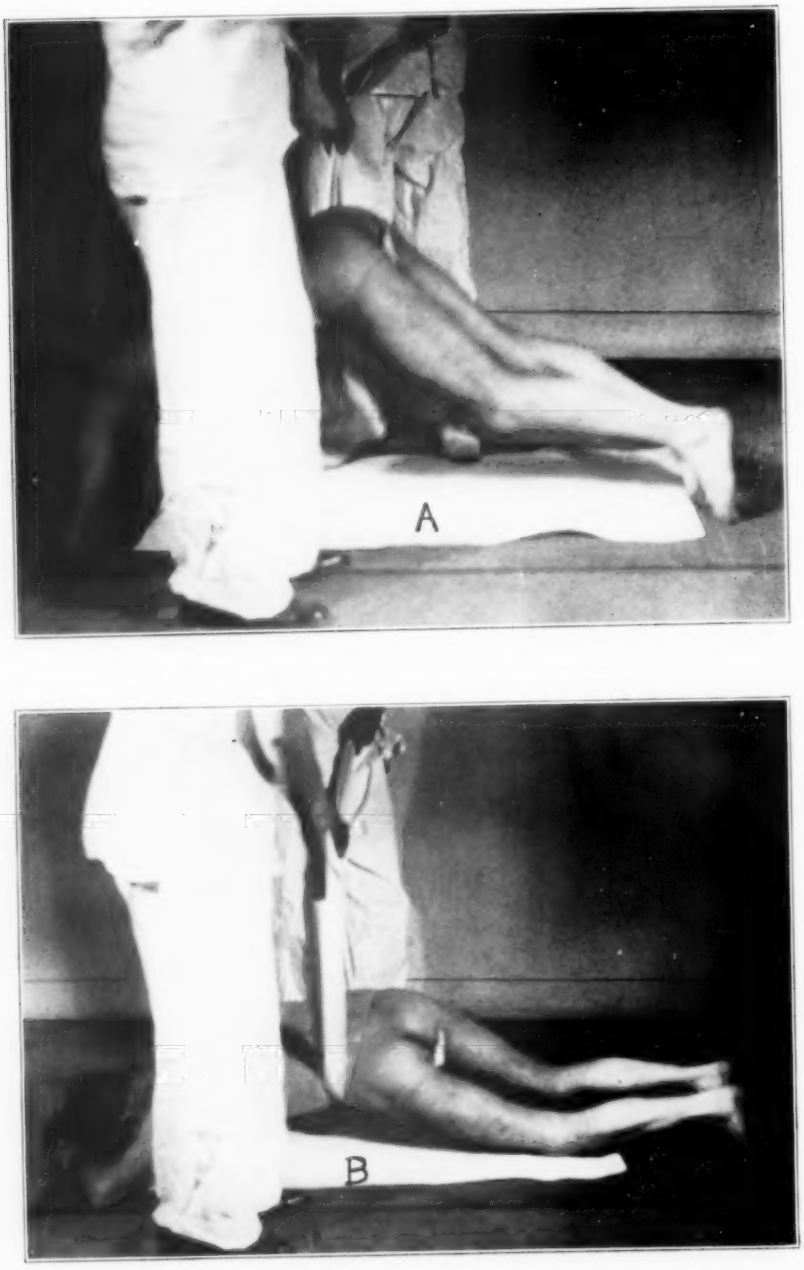
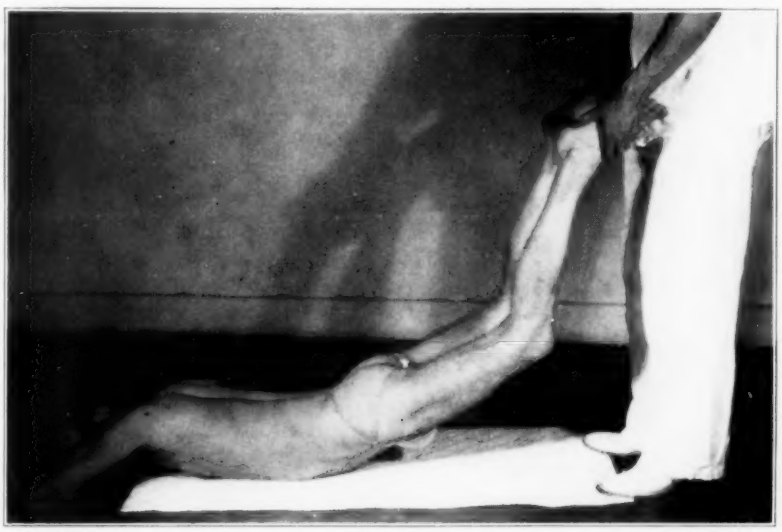


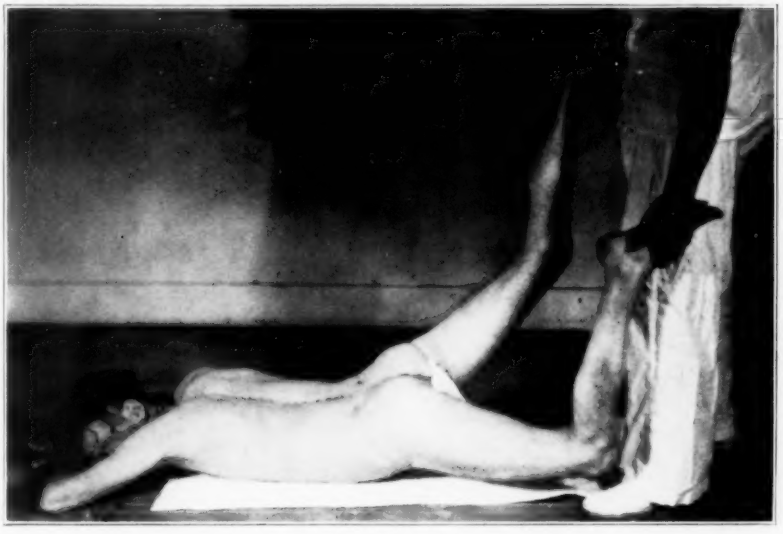
FIG. 5. — Maneuver No. 4, *A, B*, this maneuver is one in which the weight of the patient's trunk is used opposite the weight of the patient's legs to bring about flexion of the lower lumbar spine and finally of the hips. With the patient lying prone, the manipulator stands directly over the patient's pelvis (to protect his own back from strain), grasps the anterior superior spines, and with the patient as fully relaxed as possible raises the patient from the floor, causing him literally to "fold up". While maintaining this position, the operator rotates the patient's pelvis first to the left and then to the right. If the patient's weight is too great for the manipulator, this same procedure is carried out using a belt, so that two manipulators carry out the same movements of flexion and rotation as described.

more comfortably and with less apprehension. It might be well to insert here the routine which is ordinarily employed after manipulation.[3]

Following Manipulation. The patient resumes the prone position. He is now shown how to progress from the prone position to that of standing with the least effort and likelihood of further strain. It is definitely believed that many backaches are prolonged because of trauma produced by improperly executed movements. Accordingly, the patient is asked now to change from the prone to the standing position by first coming to the knee-hand position, keeping the spine arched in flexion as much as possible. When the hands approach the knees, the patient is asked to put the good foot forward (the foot opposite the



A



B

Fig. 6. — Maneuver No. 5. *A, B,* hyperextension of spine plus rotation of pelvis, first to left and then to right, with spine in hyperextension. (Lumbosacral maneuver, resulting in hyperextension plus rotation of joint.) The legs are likewise moved from left to right, so as to describe an arc in relation to the trunk. Has tendency to efface list by mobilizing lower thoracic and lumbar spine in lateral direction.

site of pain), placing it squarely on the floor, to lay both hands on the flexed knee, and to push downward, thus using the arms and the shoulders to extend the spine on itself and on the hips, instead of employing the back muscles normally coming into play in such a movement. Patients invariably welcome the relative ease with which they are now enabled to change position.

Postmanipulative Routine. Following manipulation, the comparative ease with which the patient moves about attests the relief of muscle spasm and the acute radiating pain. This outcome would prove quite short lived in many instances if the patient failed to observe more or less complete rest for a given interval. Acute back cases must avoid activity and observe a period of rest. For this reason, when patients are manipulated in the hospital, the bed is immediately made ready for them. There are boards under the mattress. The mattress is never an inner-spring type, but one made either of felt, hair, or kapok. The author feels that the inner-spring mattress is the most debilitating of modern contrivances, and constitutes a curse of the present era. Pillows are assembled in the middle of the bed, and the patient is shown how to get into the bed properly.

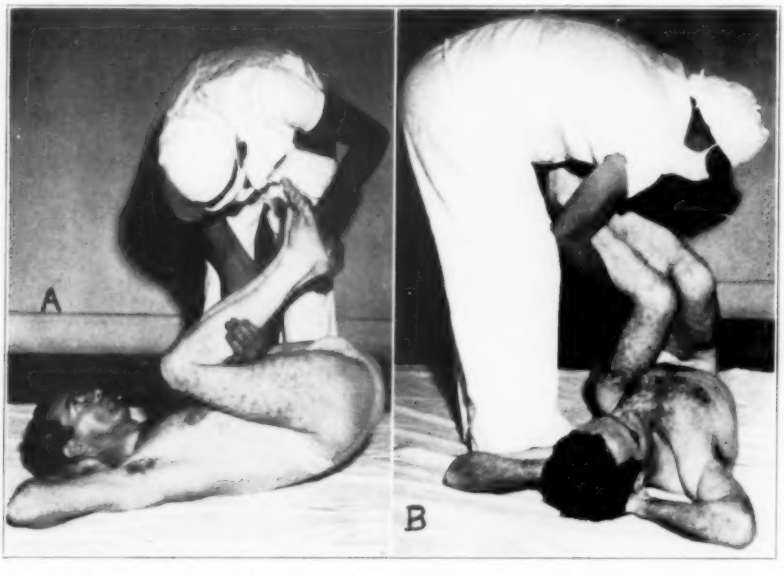


Fig. 7. — Maneuver No. 6. *A*, passive flexion of the lumbosacral joint. *B*, rotary flexion for mobilizing both the lumbosacral joint and lower lumbar and sacral interlaminar articulations.

He steps up on the stool with the right foot (given an involvement of the left side), followed by the left foot. Both hands and the right knee are placed on the bed. Bearing all weight on the right knee, he then brings up the left knee and assumes the knee-hand position on the bed. Moving over to the middle of the bed, he lies prone over the pillows, thus flexing the low back. A pillow is placed beneath feet so that resultant mild knee flexion relaxes hamstring muscles. Infra-red heat at a distance of thirty inches is applied for thirty minutes. This latter routine is repeated every four hours. Twice a day, the patient practices alternate straight leg raising, and he is manipulated as often as the condition warrants. Special attention is paid to nursing details and no type of bed pan other than the special orthopedic bed pan is ever allowed. The ordinary type of bed pan very often aggravates or precipitates an acute attack as quickly as would any other awkward movement and should be avoided. In getting out of bed, the patient assumes first the prone position, then the knee-hand position;

he then moves the knees over to the edge of the bed and, bearing weight on the left knee, he lets himself down on the right foot followed by the left.

The usual duration of hospitalization for the chronic case is ten to fourteen days; that for the acute case, from two to three days. On discharge, the patient is generally equipped with some type of support such as a canvas belt or a high-back corset. He continues the routine of heat and exercises at home as he did in the hospital. A rather important phase of postmanipulative treatment is the education of the patient to the business of saving himself from further trauma and sprain in performing his daily activities. Besides the proper methods of getting in and out of bed, he is taught how to arise properly from a sitting position and vice versa (most important in lumbosacral involvements); how to lean over properly and to arise from a stooping position; and how to drive his

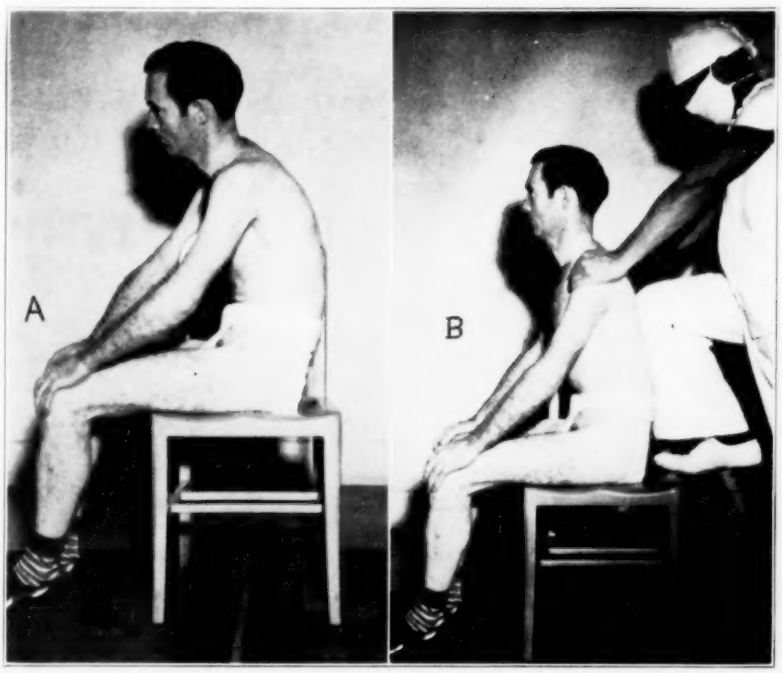


Fig. 8. — Maneuver No. 7. *A*, round back type of postural slump associated with mid-dorsal pain; *B*, passive extension of the spine from abnormal flexion toward that of hyper-extension with mobilization.

car with the least fatigue. Patients seen in the office and the home are made to follow the same routine of complete rest, heat, and exercises that is prescribed in the hospital. With the satisfactory alleviation of pain, relaxation of muscle spasm, and correction of the list, the patient is again allowed to introduce himself into his usual normal employment.

Group 2. Conditions Responding to Manipulation With Immediate Partial Relief and With Progressive Correction

Into this group fall the more chronic types of lumbosacral and sacroiliac strain. These may represent instances in which the patient has neglected to seek medical aid at the onset of the condition or in which relief has not been secured at the onset. The list which was produced by acute muscular spasm in the beginning persists because of adaptive muscular contractures. Time is necessary to overcome the contractures and to reestablish muscle balance. Low back pain from postural lordosis fits into this category. The contracted sacrospinalis

muscles and often the contracted tensor fasciae muscles make impossible immediate or dramatic recovery. This is likewise true of the minor types of congenital anomalies. Sacralization of a transverse process may be a source of long-standing strain. Then there are the conditions of an arthritic nature, slowly progressive, on which has been superimposed acute or chronic strain such as occurs in various occupational activities; roentgenograms may disclose definite and often marked arthritic changes.

Illustration. — A dentist 52 years of age whose low back disability had been present off and on for years found that it was becoming aggravated by the necessity of standing for long periods. He had received most of the known forms of conservative treatment. An examination of his back failed to reveal any list, scoliosis or paravertebral spasm. Definite postural defects were evident: a forward inclination of the head and neck, round back, flattened chest, and an anterior pelvic tilt with pendulous abdomen. The left shoulder was somewhat higher than the right; this the patient described as an occupational deformity. The area of greatest tenderness on palpation was over the lumbosacral joint. Flexion of the spine in the standing position revealed lumbar rigidity accompanied by pain at the level of the lumbosacral joint. Flexion while sitting yielded approximately the same effects. Hyperextension in the standing position evoked pain at the level of fifth lumbar and first sacral vertebrae. Straight leg raising on the right was slightly less than on the opposite side, and pain was felt in the region of the right sacroiliac joint. The roentgenograms disclosed severe arthritic changes involving the lumbosacral joint. Gentle manipulation without anesthesia appreciably mobilized the lower part of the back and afforded some immediate comfort. (Incidentally, it is possible that manipulating a back with this condition during anesthesia, thus eliminating the delicate check which the patient's voluntary actions supply, might precipitate an acute condition of the back rather than alleviate a chronic one.) Continued mobilization with other postmanipulative therapy, made it possible for the patient to continue meeting the demands of his daily routine. A well stayed garment for the lower part of the back, tailored to the patient, prevented further episodes of pain. In such instances, the eventual need for a lumbosacral fusion is always in the foreground.

Group 3. Conditions Responding to Manipulative Therapy With Some Immediate Relief But No Appreciable Correction Over an Extended Period

Into this group fall (1) rupture of an intervertebral disk or prolapse of the nucleus pulposus and (2) the facet syndromes.

1. Rupture of an intervertebral disk or prolapse of the nucleus pulposus: As was pointed out in a recent communication, these conditions produce a clinical picture similar to low back disability resulting from a number of other causes. There is the recurrence of low back pain of increasing severity, often an acute agonizing type of pain in the lower part of the back with sciatic irritation and an utter lack of response to all types of conservative treatment. Gentle manipulation has been carried out without anesthesia in a number of cases of these conditions, and while slight transient relief from the acute pain has been secured another paroxysm has immediately ensued, making the effort ineffectual. A definite diagnosis of these conditions can be made only by using iodized poppy-seed oil (lipiodol) or air to visualize a defect in the intraspinal process. The defect is seen at an intervertebral level in different views when the patient on a tilting table is being subjected to fluoroscopic study. "Spot" roentgenograms are made at different angles to verify the fluoroscopic observations. Other physical findings, such as neurologic changes and the total protein concentration in the spinal fluid, are less constant and dependable as accurate diagnostic signs.

Illustration. — A woman aged 55 with pain in the lower part of the back stated that she had been entirely well until four years before, when she began

to have backache at irregular intervals. The last attack had occurred in October 1940, confining her to bed until January 1941.

Examination in January 1941 revealed pain at the lumbosacral level associated with irritation of the right sciatic nerve. There had been repeated attacks of increasing severity. The onset was unattended by trauma so far as the patient could recall. There were localized tenderness on percussion over the fifth lumbar vertebra and the first sacral segment and lumbar pain and rigidity on forward flexion. Straight leg raising was limited on the right side. The Lasègue test was positive on the right side; the knee jerk was diminished and the ankle jerk was absent on the right side. Paresthesia was present to the following extent: There was diminution of sensation (pin prick) over the posterior part of the thigh corresponding to the first sacral dermatome and some diminution in sensation over the heel and outer three digits of the right foot.

Anteroposterior roentgenograms showed a diminution in the space between the fourth and fifth lumbar vertebrae. The lateral view definitely verified this. A lumbar puncture revealed no evidence of block and a total protein concentration of 30 mg. per hundred cubic centimeters. (The total protein content of the spinal fluid may be lowered as much as 20 mg. after the Queckenstedt test has been done. Spinal fluid to be used for the determination of the total protein content should therefore be withdrawn before this test is made.)

Because of the positive neurologic findings 5 cc. of iodized poppy-seed oil was introduced into the lower part of the spinal canal and fluoroscopic studies made with the patient on a tilting table. These revealed a constant unmistakable bilateral defect at the level of the space between the fourth and fifth lumbar vertebrae. "Spot" roentgenograms were then made for verification.

An interesting experiment was carried out during the fluoroscopic examination of this patient. After the defect had been seen and studied, the roentgenologist, Dr. Wendell Scott of the Mallinckrodt Radiological Institute of Washington University School of Medicine, had the patient flex her spine. The defect was seen to disappear, the outline of the poppy-seed oil becoming perfectly straight. Obviously the ruptured disk and nuclear material had been reduced by this manipulation of the spine. Then the patient was asked to hyperextend her spine and the defect again became evident. The interpretation of this was that the nuclear material had extruded again into the canal by the extension of the spine from the flexed position.

A laminectomy was performed and a fragmented portion of the intervertebral disk was found to be extruded and was removed.

2. The facet syndrome:

Disturbances in the intervertebral facets result from an abnormal relation between two adjacent vertebral bodies. Marked lumbar lordosis alters the normal alinement of the intervertebral joints and throws strain on their ligaments. Likewise, thinning of the intervertebral disk, whether due to rupture of the nucleus pulposus or fibrotic changes in the disk itself, will produce an apophysial subluxation. Such subluxation may cause low back pain due to strain on the joint capsules, to a decrease in the size of the intervertebral foramens or to impingement of the ends of the articular processes against either the pedicle above or the lamina below. Arthritic changes in these posterior spinal articulations may produce a similar clinical picture. In some instances gentle manipulation without anesthesia relieves the sharp pain of an acute attack. Although the exacerbations may be controlled by conservative measures, the patient has in all instances been told of the possible necessity for an operation to fuse the spine.

Illustration. — A young neurosurgeon while leaning over the wash basin was seized with such severe pain in the right lower part of the back that he fell to the floor. The pain remained acute for several days and then subsided to a continuous ache. Three weeks after the onset a second attack occurred, but it lasted only several hours. The present attack, six weeks after the initial attack, lasted

about forty-eight hours. The patient on physical examination pointed to the left sacrospinalis muscles at the level of the transverse process of the fourth lumbar vertebra and to the lumbosacral joint as the painful areas. Definite tenderness to palpation was elicited at these points. In the standing position a list of the spine to the right was evident, and this was increased with flexion of the spine.

The roentgenograms disclosed chronic arthritis and obliteration of the apophysial joints between the fourth and fifth lumbar vertebrae and the fifth lumbar vertebra and the sacrum. Manipulation was performed several times, with relief from the ache and muscular spasm. The list was almost completely effaced at the end of forty-eight hours. The patient was instructed how to execute ordinary movements so as to avoid future attacks. He understood the vulnerable nature of the lesion and the possibility of surgical intervention at a later date.

Group 4. Conditions Responding to Manipulation With Immediate Relief and Temporary Correction But Recurring With Increasing Severity

This group comprises (1) sacroiliac subluxations of chronic instability and (2) spondylolisthesis and spondyloschisis.

1. Sacroiliac subluxations:

Subluxations of the sacroiliac joint which recur, in contradistinction to acute sacroiliac strains, are often of such pronounced instability that the patient is threatened with pain and disability whenever undue physical activity is attempted. The roentgenologic technic of Chamberlin is an aid in demonstrating the presence of these lesions. According to this technic, motion of the sacroiliac joint is demonstrated at the symphysis pubis. Stereoscopic views of the pelvis (posterior projection) are studied for asymmetry, then a view of the patient's pelvis is taken (anterior projection) with weight bearing first on one leg and then on the other. By measuring the degree of movement of the symphysis pubis in these roentgenograms, the extent of sacroiliac motion is determined.

2. Spondylolisthesis and spondyloschisis:

Spondylolisthesis occurs when a separation or break occurs in the laminar arch, thus "untying" the involved vertebra and allowing it to dislocate forward on the vertebra below. This break may be a congenital defect or an actual fracture resulting from trauma. It is not always easy to differentiate the two types, for in the former there may have been a fibrous defect which was ruptured by trauma and in the latter a normally intact arch may have been fractured by the trauma. Both conditions lend themselves to conservative management by various methods ranging from sustained traction on the thighs with the hips in flexion to manipulation with or without anesthesia. When there has been a congenital defect, the effect of conservative therapy is generally not permanent and operative fusion must be done. In cases of frank fracture, satisfactory reduction and immobilization in a plaster cast for six to twelve weeks should suffice.

Illustration. — A girl aged 19 dated the onset of her backache to a fall two years before in which she injured her back. Attacks of pain had occurred every few months. She found that an attack could be precipitated by leaning forward and that the pain apparently could be reduced by lying down in bed. She described the pain as being in the midline at the lumbosacral level. There was no radiation down the thigh, but during an attack the pain radiated on each side anteriorly to the abdomen and groin. Roentgenograms disclosed spondyloschisis and spondylolisthesis involving the fifth lumbar vertebra. A spinal fusion was performed.

Group 5. Conditions in Which Manipulation is Contraindicated

Manipulation is contraindicated for compression fractures of the vertebrae, acute arthritis, tuberculosis, syphilitic disorganization, advanced rarefaction, etc. For these conditions it not only is ineffective but may be harmful.

Comment. — The success of manipulative therapy depends entirely on the selection of patients and the correctness of the diagnosis. If it is tried in all cases of low back pain, irrespective of the cause, the results may range from lack of effect to actual damage. It produces the best results in patients with group 1 conditions. Patients with conditions of groups 2 and 4 react satisfactorily and often derive as much benefit as do those with group 1 conditions. Those with group 3 conditions may be greatly relieved if the manipulation is skilful, but because of the nature of the lesions surgical intervention is often necessary.

For group 5 conditions, manipulation should never be employed. This statement is meant to emphasize the necessity for adequate study and accurate diagnosis of low back conditions.

3720 Washington Boulevard.

References

1. Jostes, F. A.: Backache. A Manipulative Treatment Without Anesthesia, J. Bone & Joint Surg. **20**:990 (Oct.) 1938.

2. Principles and Practice of Physical Therapy, Hagerstown, Md., W. F. Prior Co., 1934, edited by Mock, Pemberton and Coulter, Chapter 23 in Volume III, "Manipulative Therapy for Back Condition," edited by Frederick A. Jostes and Maurice B. Roche, p. 32.

3. Jostes, F. A.: Backache, in Barr, D. P.: Modern Medical Therapy in General Practice, Baltimore, Williams & Wilkins, 1940, vol. III, p. 3420.

PHYSICAL THERAPY IN RELATION TO DERMATOLOGY

A Résumé

ANTHONY C. CIPOLLARO, M.D.

NEW YORK

The purpose of this paper is to summarize the effects of the physical agents used in the treatment of dermatologic conditions and the diseases that may be cured or ameliorated by such agents used either alone or as adjuvants to conventional dermatologic therapy. Descriptions of the dermatoses and of the physical agents and the details of treatment must of necessity be omitted in a short communication. Yet it was thought that a review of the entire subject at this time would be of interest and of value to men interested in both physical medicine and dermatology. A complete description of all physical agents, of the dermatoses that respond to physical therapy and of the correct technic may be obtained from larger works. The appended references will lessen the task of those who wish to obtain more detailed information regarding this subject. The treatment of diseases of the skin with roentgen rays, radium or grenz rays will not be discussed.

The physical agents employed for treating dermatoses are ultraviolet rays, medical and surgical diathermy, electrolysis, common ion transfer (iontophoresis), cautery, refrigeration and balneotherapy. Massage, strapping, posture and infra-red radiation are used to a much less extent.

Ultraviolet Irradiation

Ultraviolet radiation for treating diseases of the skin may be obtained either naturally from the sun or from artificial sources of radiation. For the most part,

however, in the temperate zone artificial sources of ultraviolet rays are employed much more frequently than solar radiation. The ultraviolet ray lamps most commonly used are the air-cooled quartz mercury arc lamp, the water-cooled quartz mercury arc lamp, the low pressure quartz mercury vapor lamps of the "cold quartz" type, the quartz mercury vapor high frequency lamps and carbon arcs.

There are many diseases of the skin that improve or are cured by ultraviolet irradiation used either alone or as an adjuvant to other methods of treatment. It must be emphasized that treatment with ultraviolet rays is not the panacea for dermatological conditions it was first thought to be. There are definite indications and contraindications which must be thoroughly understood before extensive and intensive irradiation is instituted. The question of the superiority of one source of radiation over any other frequently comes up. Eliminating the theoretic considerations and eliminating the occasional special conditions that might arise, it might be said that for all practical purposes the dermatoses that respond to treatment by ultraviolet rays from one generator respond equally well to ultraviolet irradiation from other sources. The special advantages and disadvantages of the different sources of ultraviolet rays cannot at this time be considered.

The diseases for which ultraviolet irradiation is of value may be briefly discussed in alphabetical order.

Acne Vulgaris. — Practically all forms of acne vulgaris respond to ultraviolet radiation. Some cases require flushing doses and others do better with more intense radiation. Judgment is required in selecting the particular technic for the particular stage of the disease. Severe acne can be kept under control indefinitely with ultraviolet rays and in many cases can be permanently cured. Exfoliating doses of radiation from cold quartz lamps are particularly effective in improving postacne scarring.

Alopecia. — There are two main types of alopecia: the premature type, which may be subsivided into the seborrheic, idiopathic and hereditary forms, and the areata type, which may be localized or universal. All these types have been treated by dermatologists and others with ultraviolet rays. All authorities are not in agreement that this agent is essential in the treatment of these conditions. However, it can be safely stated that ultraviolet rays are a useful adjuvant in the treatment of alopecia areata and of alopecia prematura in some cases. The doses, however, should be sufficiently large to produce hyperemia or a moderate reaction. It must be understood that in no sense is ultraviolet radiation a "hair grower."

Dermatitis Herpetiformis. — In many cases dermatitis herpetiformis may be ameliorated and the severe itching improved by generalized ultraviolet irradiation. The doses, however, must not be excessive.

Dermatophytosis. — This common condition does seem to improve under the influence of ultraviolet rays. However, in cases of acute involvement further trauma should not be caused by intensive ultraviolet irradiation. Topical remedies are always used, and ultraviolet radiation is a valuable adjuvant in the treatment of some forms. One should not rely solely on ultraviolet rays for the treatment of fungous infections.

Eczema Seborrhoicum. — Occasionally this condition improves when treated with ultraviolet rays, especially if the lesions are chronic and of long standing. Fairly intensive doses may be administered to the localized areas with the water-cooled lamp. Generalized and recalcitrant lesions sometimes respond better after the administration of ultraviolet rays to the entire body. The chronic eczema of childhood and intertrigo are also sometimes benefited by ultraviolet irradiation.

Erysipelas. — Good results have been obtained in the treatment of this disorder with large doses (often erythema doses) of ultraviolet rays to the affected areas. However, it must be borne in mind that the sulfanilamide and its deriva-

tives cause photosensitization and that the two agents should not be used simultaneously. Proof of the effectiveness of ultraviolet radiation in the treatment of erysipelas is ample in the many articles that have appeared within the last few years. The technic should be scrupulously supervised.

Furunculosis. — Single lesions are treated best by surgical methods, but multiple recurrent furunculosis of long standing is benefited by generalized ultraviolet radiation. The local as well as the general resistance to the staphylococcus is increased by such treatment. Natural solar radiation is thought to be more efficacious than artificial radiation.

Neurodermatitis. — Patients with either the localized or the disseminated type of neurodermatitis improve when exposed to ultraviolet radiation. The rays are applied to the entire body. Excessive reaction should be avoided. Patients are invariably better during the summer than in winter. This is true especially of those with the disseminated and generalized variety of neurodermatitis. The same good results may be accomplished during the cold months if generalized ultraviolet rays are applied daily in suberythema doses.

Nevus Flammeus. — It is impossible to eradicate many port wine marks by any and all methods of treatment. Occasionally blistering doses of ultraviolet radiation, with or without compression, from a water-cooled lamp eradicate faint lesions or reduce the color of the more pronounced lesions. Treatments may have to be administered for several months or years.

Pityriasis Rosea. — The course of this disease can be considerably shortened by the use of ultraviolet radiation. Not only do lesions disappear but new lesions fail to appear. A cold quartz lamp seems to yield better results than a hot quartz lamp in most cases. This is probably due to the exfoliating properties of ultraviolet rays, with their shorter wavelength.

Parapsoriasis. — Parapsoriasis is a rare disease and is difficult for the average practitioner to diagnose. It is incurable, but occasionally lesions may be made to disappear by use of intensive doses of ultraviolet rays. The rule is that the lesions recur. With properly administered light therapy it is possible to keep the disease under control in some instances.

Psoriasis. — Carefully applied ultraviolet radiation in suberythema doses is valuable in the treatment of this disease. However, doses sufficiently large to cause erythema may also cause widespread dissemination and generalization of the disease. Therefore the treatments should be administered cautiously. Recently it has been learned that if the affected areas are first anointed with 3 per cent ointment of coal tar the effect of ultraviolet irradiation is accentuated. It seems that heliotherapy is preferred to artificial irradiation.

Sycosis Vulgaris. — Chronic pustular folliculitis of the bearded region is often incurable. However, patients are much better in the summer, when they are exposed to solar radiation, than they are in the winter. Localized as well as generalized ultraviolet irradiation combined with application of topical remedies often improves this condition.

Telangiectases. — Telangiectases which occur without discernible cause and those associated with radiodermatitis and rosacea may be made to disappear by intensive treatment with a water-cooled lamp with compression. One should avoid overirradiating tissues which have been damaged by roentgen rays.

Tuberculodermas. — Most of the dermatologic manifestations of tuberculosis are ameliorated in varying degrees by exposure to ultraviolet rays. The tuberculodermas most frequently treated with light are erythema induratum of Bazin, lupus vulgaris, scrofuloderma and tuberculosis cutis orificialis.

A. Erythema Induratum of Bazin: Generalized as well as localized ultraviolet irradiation combined with rest in bed, use of a diet high in vitamins and low in salt and injections of tuberculin yield satisfactory results within a few weeks.

B. Lupus Vulgaris: This disease is often improved when treated with intensive doses of ultraviolet radiation. It is well to supplement localized irradiation with generalized irradiation, especially if there is no evidence of acute visceral tuberculosis. The best results are obtained when the Finsen lamp is used. Perseverance in the administration of ultraviolet rays from other sources is essential for successful results.

C. Scrofuloderma: The best results in the treatment of this condition are obtained when localized and generalized ultraviolet irradiation are used in combination with systemic treatment. The Gerson-Sauerbruch diet and tuberculin injections are valuable adjuvants. Small and often repeated doses of ultraviolet rays (natural or artificial) are better than large infrequently applied doses.

D. Tuberculosis Cutis Orificialis: This form of cutaneous tuberculosis often yields to treatment with ultraviolet radiation. Since it is an extension of visceral tuberculosis, no matter what happens to the local lesions the outcome is usually fatal. However, everything possible to make the patient comfortable must be done.

Ulcers. — All forms of ultraviolet radiation are helpful in cases of indolent ulcers and wounds. However, one must not rely solely on this means of treatment. It should be combined with other therapeutic agents.

Diathermy

Surgical diathermy is used much more frequently in the treatment of dermatologic conditions than medical diathermy or short wave therapy. By medical diathermy is meant the use of a high frequency current for medical purposes and, by surgical diathermy is meant the use of a high frequency current for surgical purposes. The surgical diathermy currents are those used for electrodesiccation, electrocoagulation and cutting.

Medical diathermy is seldom used in relation to dermatology except for the treatment of syphilis and some of the chronic generalized and exfoliating dermatoses. Many dermatoses as well as many benign and malignant growths are treated with surgical diathermy. Warts of all types and keratoses of the seborrheic, senile, radiodermatitic and chemical types are best eradicated with some form of surgical diathermy. Even so-called permanent freckles may be made to disappear by superficial electrodesiccation. Small localized lesions of lupus vulgaris, tuberculosis verrucosa cutis, sarcoid and lupus erythematosus are quickly, easily and permanently destroyed with electrocoagulation or electrodesiccation. Cavernous angiomas and pigmented and hairy moles can be destroyed with little or no scarring by the proper selection and application of electrosurgical currents. However, in the treatment of nevi one must be careful not to traumatize a potentially malignant melanoma.

Some keloids may be eradicated by removal with the electrosurgical cutting current followed by roentgen therapy while the wound is healing. Many benign lesions, such as fibroma, granuloma pyogenicum, xanthoma, adenoma sebaceum, sebaceous adenoma and multiple benign cystic epitheliomas are often best treated with electrosurgical currents. Rhinophyma, a most disfiguring condition, can be improved with electrodesiccation, electrocoagulation or electrocutting. The type of current selected depends on the severity of the condition. Tattoo marks and powder stains may be improved by very superficial electrodesiccation and gentle curettage. Electrocoagulation is suitable for the treatment of telangiectases and superfluous hairs.

A mistake which often occurs is to remove benign and malignant new growths as well as verrucae and keratoses with moderately strong electrosurgical currents without using anesthesia. The operator has to work hurriedly and may not remove the lesion thoroughly because of the great pain. Anesthesia is always recommended.

Electrolysis, Galvanism, Common Ion Transfer (Iontophoresis)

A current suitable for electrolysis may be obtained from devices which require either dry cells or a direct or alternating current. The voltage employed is generally $22\frac{1}{2}$ and the milliamperage from 0.25 to 2. The active negative electrode is an exceedingly thin needle with a blunt end. A cheap and convenient apparatus may be made from specifications to be found in an article published by the author in *The Journal of the American Medical Association.* To master the technic of electrolysis, one must have instruction for a considerable length of time. The technic is not easy to master. However, with patience and the proper frame of mind, good eyesight and a steady hand, one can learn to use electrolysis well.

The galvanic current is used mostly for the removal of superfluous hair and for iontophoresis. The drugs most commonly used for iontophoresis (common ion transfer) are acetyl-beta-methylcholine (mecholyl), histamine, zinc sulfate and copper sulfate.

Telangiectases associated with radiodermatitis, rosacea and nevus araneus are eradicated without leaving scars by carefully applied electrolysis. Small nevoid and seborrheic keratoses, multiple benign cystic epitheliomas and adenoma sebaceum as well as small common hairy nevi and the flat, digitate, filiform and small common warts can be destroyed without disfigurement by the galvanic current. There is no danger in treating brown hairy moles that have been present since birth by this method, provided the diagnosis is correctly made. It is difficult sometimes to differentiate a potentially malignant mole from one which is benign. Whenever there is doubt as to the diagnosis one should resort to radical destructive methods or leave the mole alone and carefully observe it periodically.

Many dermatoses have been treated with iontophoresis. There is considerable controversy regarding the effectiveness of copper and zinc ionization in the treatment of fungous infections of the skin, especially dermatophytosis and chronic recurrent eczema of the hands. Most workers agree that mecholyl ionization is valuable in the treatment of chronic varicose ulcers, lupus pernio, sclerodactylia, scleroderma and Raynaud's disease.

Cauterization

The actual cautery consists of a red hot or white hot object which has been heated in a flame or kept constantly heated with an electrical device (thermocautery, electrocautery and galvanocautery). Many small localized lesions occurring on the skin may be destroyed by cauterization. Small pedunculated fibromas, verrucae — especially of the genitals (venereal warts) — granuloma pyogenicum, exuberant granulations in sluggish wounds and ulcers, skin tags occurring on the neck and chest of women, small, flat, filiform and digitate warts occurring on the face and in the bearded area, senile freckles and numerous other conditions can be destroyed with the actual cautery, and the cosmetic result is good. Cutaneous malignant growths as a rule are not treated with cauterization.

Refrigeration

Refrigeration is important and useful for many dermatoses. The ethyl chloride spray is used for freezing before minor surgical operations and for destroying larva migrans. Solid carbon dioxide (commercial dry ice) is the freezing agent most frequently used in the treatment of dermatologic conditions. When dry ice is not available all that is required for manufacturing solid carbon dioxide in the office is a tank of carbon dioxide and suitable tubes or a special apparatus for its collection. Liquid air was formerly used for refrigeration

purposes but is no longer used in relation to dermatology. The Sparklet and the Lortat-Jacob cryocautery are useful in manufacturing solid carbon dioxide in the office. Its action can be easily controlled and its technic can be mastered within a short time. The results of treatment are excellent. Where intensive treatments are administered the scar is soft and pliable. Many different dermatoses can be treated by this method but the most common ones are warts of all kinds, pigmentary disturbances, lupus erythematosus, small localized lesions of lupus vulgaris, the hyperkeratotic forms of dermatophytosis, telangiectases, angioma cavernosum, pigmented moles, both of the hairy and of the nonhairy variety, and port-wine stains. Recently dry ice has been used for treating postacne scars, and some investigators have even claimed excellent results in the treatment of acne vulgaris with "slush." "Slush" is made by pulverizing solid carbon dioxide to which acetone and powdered sulfur have been added.

Balneotherapy

Balneotherapy refers to the use of medicated baths and wet dressings with various solutions. This method of treatment is extremely valuable, especially for acute, extensive, inflammatory, exudative, vesicular and bullous eruptions. Medicated baths of long duration are also used for the treatment of extensive pyogenic eruptions, such as impetigo neonatorum and generalized furunculosis, and for the treatment of generalized pruritus and scaly dermatoses, such as dermatitis exfoliativa of the arsenical and other varieties. Medicated baths allay the pruritus accompanying various dermatoses, especially urticaria. Patients with pemphigus are made more comfortable when immersed in a medicated bath. Continuous medicated baths are used in some dermatologic centers.

Massage, Posture, Strapping and Heat

Massage, posture, strapping and heat are used very little in the treatment of dermatologic conditions. Alopecia, contracting scars, keloids and scleroderma may be benefited by scientific massage. Improvement frequently follows massage of pitted scars which result from acne. Treatment should be carried out for several months and should be instituted soon after the acne involutes.

The use of bandages, gelatin boots, elastoplast and elastic stockings and elevation of the extremities aid circulation in cases of eczema hemostaticum and varicose ulcers. Indolent ulcers of the extremities may be made to respond more rapidly when topical remedies are used in combination with proper support of the circulation by means of appropriate strapping.

Raynaud's disease and sclerodactylia are helped by posture, massage, heat and alternate hot and cold baths.

Summary

Few people realize the role that physical agents play in the treatment of dermatologic conditions. In this paper an attempt has been made to mention all the physical agents used in relation to dermatology and to mention most of the diseases that are either cured or improved by these physical agents. For brevity it has been necessary to make this article extremely sketchy and to write it in outline form. The purpose of the essay is simply to bring to the attention of the physician the fact that physical therapy is important to the practice of dermatology and that without physical agents one could not adequately practice this specialty. It is conceded by many dermatologists that the progress made in the therapy of dermatoses within the past decade or two is due largely to the development of physical methods. This is especially true when roentgen rays, radium and grenz rays are included among the physical agents.

40 E. 61 St.

References

Kovacs, Richard: Electrotherapy and Light Therapy, ed. 3, Philadelphia, Lea & Febiger, 1938.

Krusen, Frank H.: Light Therapy, ed. 2, New York, Paul B. Hoeber, Inc., 1937.

————: Physical Medicine, Philadelphia, W. B. Saunders Co., 1941.

Cipollaro, A. C.: Electrosurgery in Dermatology, Med. Rec. **143**:437 (May 20) 1936; **143**:471 (June 3) 1936.

————: Electrolysis, J. A. M. A. **3**:2488 (Dec.) 1938.

————: The Role of Ultraviolet Therapy in the Treatment of Diseases of the Skin, Med. Rec. **149**:415 (June) 1939.

————: Principles and Practice of Physical Therapy, Hagerstown, M.D., W. F. Prior Co., 1934, edited by Mock, Pemberton and Coulter, Chapter 18 in Volume I, "Physical Therapy in Dermatology," edited by G. M. MacKee, and A. C. Cipollaro, Chapter 4 in Volume III, "Treatment of Skin Diseases with Radiation," edited by G. M. MacKee, and A. C. Cipollaro.

————: Electrolysis, in Handbook of Physical Therapy, ed. 3, Chicago, American Medical Association, 1939.

METHODS OF APPLYING HEAT LOCALLY IN GENERAL PRACTICE *

FRANK H. KRUSEN, M.D.

Section on Physical Therapy, Mayo Clinic

ROCHESTER, MINNESOTA

The local application of heat is one of the most common procedures in the practice of medicine. Heat may be applied by conduction, convection or conversion.

Conductive heating can be accomplished by the direct application of a warm object to a bodily surface. Conductive heating devices can be heated by means of (1) warm air, (2) warm water, (3) chemicals or (4) electric resistance coils. Previously heated solids or semisolids also can be employed for conductive heating.

Convective heating usually is accomplished by reflection of infra-red or luminous radiant energy on some region of the body.

Methods of Applying Heat Locally

Conductive Heat. — 1. Warm air devices. — Hot air chambers, blowers or applicators heated from within by means of hot air have been used medically. Hot air chambers, constructed of metal or wood and lined with asbestos, were developed by Bier[1] and described by Meyer and Schmieden[2] more than thirty years ago. Such chambers still are employed enthusiastically by South American and Italian physicians, although they have been abandoned to a large extent in this country. The chambers have an opening at one end for the insertion of an arm or leg. Usually they are heated by means of an alcohol lamp or a can of solidified alcohol. As a rule, the air within the chamber is extremely hot, attaining a temperature of 250 to 160 F. (121 to 127 C.).

* Read at the Midwestern Sectional Meeting of the American Congress of Physical Therapy, Madison, Wisconsin, April 16, 1941; also before the Meeting of the Academy of Physical Medicine, New York, New York, April 28, 1941.

The Council on Physical Therapy of the American Medical Association recently approved a device which circulates warm air within a sleeve fastened to an extremity. Also currently recommended is an apparatus which circulates hot air within a distensible rubber bag. The bag is inserted into the vagina for treatment of pelvic inflammatory disease. The pressure usually is 1 to 1½ pounds (0.5 to 0.7 kg.) and the temperature not more than 130 F. (54.4 C.)[3].

2. Warm water devices. — The time-honored hot water bottle is included in this category, as is the so-called Elliott treatment regulator. The hot water bottle is well known and does not require a description. Recently, an electric immersion heater has been developed which can be inserted in the standard hot water bottle in place of the usual cap. Its purpose is to maintain the temperature of the water within the bag at a constant level.

The Elliott device heats and circulates water which is passed under pressure through thin rubber applicators. These applicators are constructed for insertion into various bodily orifices.

3. Chemical devices. — Pads which utilize the latent heat of crystallization to produce prolonged heating effects have been employed therapeutically. These pads have been constructed for application to the eye,[4] the frontal region[5] or other regions of the body.[6] One type[4,5] of chemical heating pad contains sodium acetate (90.5 per cent), glycerin (3 per cent), sodium sulfate crystals (2 per cent) and anhydrous sodium sulfate (4.5 per cent). These chemicals are sealed within the rubber applicator which is boiled for ten minutes before use. The pad then will remain at a temperature of about 108 to 114 F. (42.2 to 45.5 C.) for approximately an hour. Its duration of service is about 600 hours.

The other type of chemical heating pad[6] depends on the chemical reaction which occurs when water is added to a mixture of finely divided iron (84 per cent), sodium chloride (6 per cent) and manganese dioxide (10 per cent). These chemicals are placed in a canvas bag enclosed in flexible rubber. Heat will be liberated if 2 fluidrams (7.5 cc.) of water is placed inside the container. If the cover is removed after use, it will cool rapidly. It has a lifetime of service of eighty to 125 hours.

4. Devices containing electric resistance coils. — Pads containing electric resistance coils with a flexible insulated covering are in common use today. Such pads are not satisfactory for treatment although they have become household utility devices. They tend to become too hot; temperature control is inadequate and it has been reported occasionally that they produce burns or shocks.

Electric pads which can be controlled more accurately than the household heating pad have been constructed for therapeutic purposes. One such device[7] consists of a flat coil enclosed in a waterproof cover. A thermostat of considerable accuracy allows minute adjustments of temperature; and a mercury thermometer, inserted in a pocket in the cover, allows close observation of the temperature. The pad is intended to be used for the purpose of maintaining hot moist dressings at a constant temperature.

Parts of an electrically heated suit, similar to those worn by stratosphere fliers and deep sea divers, have been employed therapeutically for local application of heat to a certain region of the body. Brown and Allen[8] used cuffs or sleeves of this type in treatment for peripheral vascular diseases. Recently, I have had constructed a device of this type for administration of conductive heat to the shoulder and upper part of the arm. It has the advantage of providing uniform heating to all the surfaces of the shoulder and arm surrounded by it. All or any part of an electrically heated suif

thus can be constructed so that regulated conductive heat can be applied to all sides of various regions of the body.

An ingenious electric blanket has been developed recently which was intended primarily for household employment but may be found extremely useful in medical practice.[9] A transformer within the control box reduces the usual 115 volt current to 18 volts at the blanket. This practically eliminates the danger of electric shock. A thermostat in the control box can be adjusted manually to the desired level of temperature, which is then maintained despite changes in the temperature of the room. If the environmental temperature rises, the blanket will cool; and if the environmental temperature drops, the blanket will warm up until the predetermined level is reached.

This type of blanket should prove valuable for maintenance of a constant, optimal bodily temperature in certain cases of peripheral vascular disease. It might also prove valuable for keeping tuberculous patients at a constant comfortable warmth while sleeping in well ventilated rooms during cold weather. It should likewise be valuable in providing a safe type of warm bed to combat postoperative surgical shock. There would not be the danger, observed so frequently in the past, of burning semiconscious patients with hot water bottles.

5. Previously heated solids and semisolids. — The practice of applying hot irons, hot bricks, hot salt bags or hot sand bags to various regions of the body for relief of pain or of muscular spasm has declined recently. This is primarily because the temperature of readily available simple devices of a similar nature can be controlled more accurately.

Certain European spas have popularized the employment of hot mud packs; however, the claims for alleged specific effects of various types of "therapeutic" muds have been vague and unconvincing. Typical examples of this kind of supposedly therapeutic mud are the "Fango" mud and the "Piestany" mud. There is no convincing evidence that such muds contain constituents which enhance their effectiveness when they are applied to the surface of the body.

R. L. Bennett, working in my department, checked the action on photographic paper of the supposedly radioactive "Fango" mud. He found that there was insufficient radioactivity to fog the paper, even after exposure for twenty-four hours, and concluded that the supposed radioactivity would have a negligible therapeutic effect. In addition, comparative clinical tests were performed which did not reveal any essential differences between the thermal effects of "Fango" mud, ordinary garden mud and Mississippi valley clay. It would seem that "therapeutic" muds do not have any particular advantage over simpler and cleaner methods of applying heat.

Hot paraffin can be applied easily to local regions and is clean and effective. All the necessary equipment, "jelly wax" or ordinary commercial paraffin, a kitchen stove and a double boiler, can be found in any kitchen. I frequently recommend the use of paraffin for local application of heat when the patient lives where electricity to operate a home-made baker or a simple heat lamp is not available. However, even in well equipped institutions, paraffin frequently is utilized in preference to other local heating measures. The paraffin is placed in the inner pan of the double boiler and water is poured into the outer pan. The boiler then is placed on the stove and heated until all the paraffin has melted. It is allowed to cool then until a thin film of solidifying paraffin has formed on the surface, at which time the paraffin will be at its low melting point of approximately 167 to 176 F. (75 to 80 C.).

The paraffin then is painted over the region which is to be treated. About a dozen coats are applied in rapid succession. The layers of paraffin

solidify almost instantly to form a thick warm covering of the surface. This covering is left in place for at least thirty minutes.

Variations of this technic include dipping of a part (a hand or foot) in the paraffin about six times to form a similar warm paraffin pack, applying alternate layers of bandage and paraffin to a joint to provide a warm, firm supporting dressing, or leaving the part immersed in a special large paraffin bath for thirty minutes or longer.

I have placed thermocouples beneath paraffin packs or dressings and have found that the temperature is maintained above normal levels for more than an hour.

Convective Heat. —Convective heating is accomplished by irradiation of the bodily surface with rays from the visible and infra-red regions of the electromagnetic spectrum. A beam of visible light can be split by means of a triangular prism into the various colors of the rainbow. The invisible ultraviolet rays are above the violet end of this rainbow and the invisible infra-red or heat rays lie below the red end of the rainbow.

A variety of infra-red generators have been marketed for therapeutic use. The units commonly employed consist of a spiral coil of resistant metal wire wound around a cone made of steatite or porcelain, or they may be plates, rods or disks of resistant material such as carborundum. Such a unit usually is placed in a cup-shaped reflector which will cause the rays to converge on the part which is to be treated. The infra-red lamp employed by the physician differs little from the familiar household electric heater, the chief difference being the shape of the reflector. The household heater has a flatter, platelike reflector which diffuses the heat rays through the room; whereas the infra-red lamp has a more concave, cup-shaped reflector which concentrates the rays on a small, local region. The heating units themselves may be used interchangeably because the radiation from one is practically identical with that from the other.

Therefore, it is obvious that infra-red rays are not mysterious or unusual. Nevertheless, even though infra-red rays are simply heat rays, they are of considerable usefulness in therapy. For many years, illumination engineers have known that radiation from luminous sources such as tungsten or carbon filament bulbs penetrates human tissues to a greater depth than that from nonluminous sources such as the infra-red coils or plates. As a rule, however, physicians have not been familiar with this fact. Many physicians have believed erroneously that the radiation from infra-red coils penetrates to great depths. Actually, the rays from the far portion of the infra-red spectrum which are produced by these nonluminous or "black body" radiators penetrate in appreciable amounts to a depth of less than 1 mm.

The greatest amount of penetration of convective heat can be obtained from luminous sources (which produce considerable amounts of radiation in the near portion of the infra-red spectrum) such as carbon filament or tungsten filament lamps. These infra-red luminous bulbs can be placed in the same cup-shaped reflectors as are employed for the nonluminous infra-red coils. The penetration through human tissues of radiation from the luminous bulbs has been estimated variously up to depths of 1.5 cm. Hardy and Muschenheim[10] reported recently, however, careful investigations which indicated that the transmission through skin of even these most penetrating infra-red rays is slight. They found that about 95 per cent of the rays were absorbed within 2 mm. of the surface and 99 per cent within 3 mm.

It will be advisable to employ a source of radiation which is rich in the more penetrating near infra-red rays for most therapeutic applications. Therefore, convective heat treatments usually should be administered with

a device which converges the rays from a luminous source on the part to be treated. For example, one type of luminous therapeutic heat bulb, which is known as the "Mazda CX" bulb, is particularly rich in the slightly more penetrating near infra-red rays. Thirty per cent of the radiation from this type of bulb is within the most penetrating range with wavelengths between 770 and 1200 millimicrons.

One disadvantage of the high voltage heat bulb is that it produces considerable glare. I recently described[11] a new type of infra-red lamp with a special black glass filter which transmits most of the penetrating near infra-red rays but cuts off practically all the visible rays and thus eliminates glare. This lamp seems to be especially valuable for application of heat to the face and to the upper anterior part of the body because the patient is not annoyed by glare.

A strange phenomenon has been the development in this country of small inexpensive heat lamps consisting of a bulb on a small reflector attached to a handle. It is naturally of great usefulness to have inexpensive heat lamps readily available: however, nobody wishes to hold such a lamp steadily in his hand long enough for it to produce any marked therapeutic effect. Thirty minutes of local application of heat usually is required to produce an effective increase in temperature of the tissues. It is extremely tiresome, even if the lamp is shifted from one hand to another, to hold a lamp steadily in one position for thirty minutes.

To eliminate this difficulty, I have had constructed an inexpensive "clamp lamp" which was described a few years ago.[12] This lamp has a cup-shaped reflector containing a luminous heat bulb. Instead of a handle, a clamp similar to those employed for "photo-flash" lamps is provided. This inexpensive clamp lamp can be attached to the side of a bed or to the back of a chair. A ball and socket joint permits adjustment of the reflector at any angle. The lamp can be employed easily for prolonged heating of various local regions of the body.

The old style "baker," which consists of a slightly curved roof-like reflector supported by adjustable legs, still is considered extremely serviceable. Beneath this reflector are several small electric light bulbs. This tunnel-like heating device can be placed over a leg, an arm or the back.

A similar, less elaborate baker for home use can be constructed of four light bulbs covered by a piece of polished sheet tin supported on a light framework of iron rods.

Physical Principles Concerned in the Local Application of Heat

Heat is a form of irregular molecular motion. Therefore, thermal energy can be transmitted from one body to another by continuation of this molecular motion. Such interchanges are taking place continually between the human body and its environment, and this transmission of molecular motion can take place by conduction, convection or conversion.

All the conductive methods which have been described require direct contact of the hot applicator with some surface of the body. Luminous and infra-red rays result from electromagnetic disturbances of the ether. According to Huygens' wave theory, there is a propagation of energy in the form of waves. Wavelength is the distance between the crests of adjoining ether waves.

Because the frequency of vibration of a given source of heat energy is uniform and the velocity of the radiation is constant, the distance between any two adjacent waves will be identical with the distance between any other two waves derived from the same source.

The electromagnetic spectrum can be defined as a graphic representation of the various waves of energy in ascending order of length. Starting with the shortest known rays, the cosmic rays, the next shortest in ascending order are the gamma rays of radium. Forming a continuous spectrum in succession of increasing wavelengths from these are the roentgen rays, ultraviolet rays, visible light, infra-red rays, hertzian waves (including the short and long radio waves) and alternating current waves.

Those portions of the spectrum which contain radiations employed for convective heating are the visible and infra-red regions. The wavelengths of the rays from this portion of the spectrum vary between 290 and 15,000 millimicrons.

Action and Uses of Local Heating Devices

The action of conductive or conversive heating is superficial because the penetration of heat is always slight. Normally, the temperature of the blood in various peripheral regions of the body is lower than the central temperature of approximately 98.6 F. (37 C.). The temperature of the skin, fat and muscle in peripheral regions varies and usually is considerably lower than the rectal temperature. Local applications of heat will tend to raise the temperature in peripheral regions.

It is probable that bodily tissues cannot tolerate a prolonged increase of external temperature to more than 113 F. (45 C.) without being damaged. For short periods they can tolerate changes of external temperature exceeding 36 F. (20 C.) without evidence of injury. Local application of heat produces dilatation of blood vessels and an increase in the rate of flow of the blood. The tendency toward rapid dissemination of the heat finally may result in an increase in the systemic temperature. There is evidence that the heat causes increase of phagocytic and local metabolic activity. Heating of the blood increases carbon dioxide tension and acidity, and it has been suggested[13] that these changes may be of some value in modifying the reactions of tissues to infection.

It should be remembered that local exposure to infra-red radiation will produce a rise of temperature of a considerable volume of blood as it circulates through the cutaneous capillaries. The temperature of the blood will reach a level exceeding that of the average systemic fever without any appreciable rise in the systemic temperature. Sweating and muscular relaxation are produced by local heating, as well as possible stimulation of intracellular oxidation.

Treatments for thirty minutes daily in the hot air chambers and blowers have been recommended particularly as an adjunct in the management of various forms of arthritis. The vaginal applicator which is heated by circulating hot air usually is employed for sessions of one hour daily in treatment for specific and nonspecific inflammatory disease of the pelvis.

Similar to the hot air device, the Elliott apparatus, in which hot water circulates through a distensible rubber bag within the vagina, is employed chiefly for pelvic inflammatory disease. The water pressure meter should register 2 or 3 pounds (0.9 or 1.4 kg.). Hourly treatments are given usually once or twice a day. Randall and I[14] found that complete clinical remissions were obtained in 55 per cent of our forty-five cases of chronic gonorrheal inflammatory disease of the pelvis in which treatment with the Elliott device was employed. In an additional 22 per cent negative cultures developed, but there was evidence of residual salpingo-oophoritis. In 11 per cent improvement did not occur, and in 11 per cent insufficient treatment was received. Of our group of 173 patients suffering from nonspecific pelvic

inflammatory disease, 30 per cent were greatly improved after Elliott treatment; 27.7 per cent were moderately improved; 9.8 per cent were slightly improved and 5.7 per cent were unimproved. Surgical treatment was required in 26.5 per cent of the cases. Pelvic heating with the Elliott device was employed successfully to promote absorption of exudates after pelvic operation.

The Elliott treatment has been applied through a rectal applicator for chronic prostatitis (specific and nonspecific), and a urethral applicator was employed by Emmett[15] in treatment of nonspecific urethritis among females. Welch and I[16] have administered Elliott treatments through a colonic stoma to lessen edema of the spur and to permit earlier application of clamps for the second stage of the Mikulicz operation.

The chemical heating pads have been employed chiefly for chronic inflammation of the eye or nasal accessory sinuses. The larger chemical heating pad has been used as a substitute for the hot water bottle and has the advantage of remaining hot for a longer period.

Ordinary electric heating pads are not recommended unless more suitable methods of heating are not available. The compress with accurate thermostatic control can be employed to maintain the warmth of wet dressings at a proper level for infections, acute inflammations, cutaneous diseases and surgical conditions. The electrically heated sleeves, cuffs and pads which have accurate control can be employed for peripheral vascular diseases, arthritis and traumatic lesions.

Applications of hot paraffin have been recommended chiefly for contractures, arthritis, fibrositis, post-traumatic stiff joints and lacerations.

The application of infra-red radiation has been advocated for numerous conditions. It tends to facilitate absorption of exudates because heat produces not a passive congestion but an active hyperemia with an increase in the volume of blood flowing through the region rather than engorgement and stagnation.

Local treatment with infra-red radiation has been recommended[17, 18] for various types of neuritis, myositis, fibrositis and arthritis; for circulatory diseases; for certain types of paralysis, and also for traumatic lesions such as contusions, sprains, dislocations and fractures. One should always bear in mind that various conductive methods of applying heat frequently can be substituted for infra-red radiation, or vice versa. The therapeutic effects are basically the same. The choice of the superficial heating agent will be largely a matter of convenience.

After trauma, heat should not be applied until the danger of capillary oozing, with extravasation and ecchymosis, has ceased. This usually will require twenty-four to forty-eight hours. During this interval, tight dressings, immobilization and applications of cold are in order. As soon as this danger disappears, applications of heat for periods of thirty minutes or longer, once or twice a day, should be instituted. After the applications of heat, massage sometimes can be administered. The heat and massage will tend to promote absorption and to prevent the formation of organized hematomas.

Local applications of conductive or convective heat frequently can afford benefit in cases of traumatic synovitis, tendovaginitis, bursitis, spastic muscles and strained muscles.

Contraindications to the Local Application of Heat

The great danger in applying any form of therapeutic heating is possible burning. Patients have been known to allow themselves to be burned, thinking that they were supposed to tolerate the pain. It is inadequate to

give the patient a bell and to tell him to ring it if the part becomes too hot. Although he had been so instructed, one patient promptly permitted himself to be burned and then explained that he did not know how much "too hot" was. For this reason, the patient must be told that he should feel only comfortable warmth; that the minute he feels the slightest discomfort, he should summon the attendant. He should be warned that excessive heat will do more harm than good.

Heat always must be applied with extreme caution to extremities in which the circulation is impaired. In the presence of peripheral vascular disease, heat will be disseminated poorly by the impaired circulation. As a result, burns are more likely to occur. Moreover, if a burn does result, slow healing lesions or even gangrene may occur in the devitalized tissue. It should be remembered in dealing with peripheral vascular disease that the local application of heat to an unaffected region may produce vasodilatation in the affected part. Local heating of an uninvolved region may be just as effective as direct heating, and it is much safer. If heat is to be applied locally to the affected extremity, prolonged applications at fairly low temperatures, 91.4 to 95 F. (33 to 35 C.), are safer than short exposures at high temperature.

Heat always must be applied with great caution over old scars which are comparatively avascular and will blister readily. It is often expedient to cover small scars in a region which is to be heated. Likewise, heat must be applied with extreme caution over anesthetic regions. Because the patient has no sensation, he may be burned without realizing it.

Knapp[19] recently has expressed the opinion that in most instances just sufficient heat should be applied to produce a faint pink blush on the skin. He concluded that if there was a mottled erythema of the skin, the heat was too intense. It seems obvious that the mottling, so commonly observed during intense heating of the skin, indicates unequal distribution of the hyperemia in the region under treatment. When possible, it is safer to avoid the mottling.

Certain cutaneous rashes may be aggravated by local exposures to heat. As a rule, local heat should not be applied in febrile conditions. Occasionally, sensitivity to heat, attributable usually to derangement of the heat regulating mechanism, may be encountered. In this event, local heating must be applied with great caution.

When Elliott treatments are administered to the vagina, incorrect placing or improper distention of the applicator may produce excessive localization of heat in a small region and severe burns may ensue. Large sloughs of the anterior vaginal wall have been reported after incorrect employment of the procedure.

If hot paraffin is used for local heating, in rare instances a mild paraffin rash may be produced.

Summary

There are numerous sources of heat which are readily available and which can be employed in local treatment for various diseases. Devices heated by warm air, warm water, chemicals, electric coils, previously heated solids and semisolids and several sources of infra-red radiation can be used.

These devices are employed chiefly to increase local temperature and circulation, to increase local metabolism, to promote absorption and to relieve muscular spasm. Local applications of heat are indicated especially in the management of acute and chronic inflammations, impairment of circulation and various traumatic lesions. Heat should be applied with great cau-

tion in the presence of peripheral vascular disease, scars or anesthesia of the skin.

References

1. Bier, August: Hyperemia As a Therapeutic Agent, (Translated by G. M. Blech). Chicago, A. Robertson & Co., 1905, p. 239.
2. Meyer, Willy, and Schmieden, Victor: Bier's Hyperemic Treatment in Surgery, Medicine, and the Specialties; A Manual of Its Practical Application, Philadelphia, W. B. Saunders Co., 1908, p. 209.
3. Newman, L. B.: An Improved Method for Applying Pelvic Heat Using Air, Am. J. Obst. & Gynec. **38**:725 (Oct.) 1939.
4. Council on Physical Therapy: Altherm Eye Pad Acceptable, J. A. M. A. **103**:563 (Aug. 25) 1934.
5. Council on Physical Therapy: Altherm Sinus Pad Acceptable, J. A. M. A. **106**:921 (Mar. 14) 1936.
6. Council on Physical Therapy: Thermat Self-Heating Heat Pad Acceptable, J. A. M. A. **105**:118 (July 13) 1935.
7. Council on Physical Therapy: Cooley Compress Acceptable, J. A. M. A. **113**:1130 (Sept. 16) 1939.
8. Brown, G. E., Jr., and Allen, E. V.: Personal Communication to the Author.
9. Krusen, F. H.: Physical Medicine; The Employment of Physical Agents for Diagnosis and Therapy, Philadelphia, W. B. Saunders Co., 1941, pp. 144-165.
10. Hardy, J. D., and Muschenheim, Carl: Radiation of Heat From the Human Body, V. The Transmission of Infra-Red Radiation Through Skin, J. Clin. Investigation **15**:1 (Jan.) 1936.
11. Krusen, F. H.: A New Type of Filter for Efficient Infra-Red Radiation, Proc. Staff Meet., Mayo Clin. **16**:22 (Jan. 8) 1941.
12. ————: A Simple, Inexpensive Heat Lamp, J. A. M. A. **107**:780 (Sept. 5) 1936.
13. Bazett, H. C.: The Physiological Basis for the Use of Heat. In Mock, H. E., Pemberton, Ralph and Coulter, J. S.: Principles and Practice of Physical Therapy, Hagerstown, Md., W. F. Prior Co., Inc., 1935, vol. 1, chap. 4, p. 29.
14. Randall, L. M., and Krusen, F. H.: A Consideration of the Elliott Treatment of Pelvic Inflammatory Disease of Women, Arch. Phys. Therapy **18**:283 (May) 1937.
15. Emmett, J. L.: Elliott Treatment of Chronic Urethritis of Women; A Preliminary Report, Proc. Staff Meet., Mayo Clin. **10**:545 (Aug. 28) 1935.
16. Welch, C. S., and Krusen, F. H.: An Applicator for the Use of the Elliott Treatment in the Large Intestine Through the Colostomy Stoma, Am. J. Surg. n. s. **40**:487 (May) 1938.
17. Troup, W. A.: Therapeutic Uses of Infra-red Rays, London, Actinic Press, 1930, p. 66.
18. ————: Infra-red and U-V Irradiation of Injuries in Sport, Brit. J. Phys. Med. **9**:172 (Jan.) 1935.
19. Knapp, M. E.: Personal Communication to the Author.

Presidential Address

THE CONTRIBUTIONS OF PHYSICAL MEDICINE TO THE ART OF HEALING *

A. R. HOLLENDER, M.D.

MIAMI BEACH, FLORIDA

A year ago when I became the recipient of the highest honor within the gift of the Congress, I expressed my keen appreciation and gratitude to this body. Today in assuming the presidency I reiterate that acknowledgment and at the same time feel impelled to express a realization of the involved responsibility not only with regard to our organization as such, but its relation to national defense.

Our nation, devoted to the ideals of peace and to peaceful ideals, is again forced to make preparations for the defense of our sovereignty. This imposes upon every citizen or body of citizens certain duties to which I will revert at the conclusion.

In compliance with academic custom, I have chosen for my inaugural address a subject of particular concern to this body. It deals with the question: "To what extent has physical therapy proved of value to scientific medicine?" Without such service no branch or discipline would have the right to exist. In our particular discipline this is of considerable importance, for while physical therapy has been employed empirically since the very dawn of mankind, it is also the youngest of recognized specialties in relation to modern organized medicine.

This apparent paradox can be illustrated by an example or two. Primitive man has instinctively basked in the sun for its beneficent effects, yet rationalized heliotherapy has but recently been accorded citizenship. Prehistoric man has learned to cool his body by immersing it in an accessible river, lake or ocean, and to relieve his aches in natural thermal baths; yet scientific hydrotherapy, which includes also thalassotherapy, has been adequately studied and developed only within our present generation.

Perhaps one of the main reasons for the late appearance of physical measures in medicine is to be sought in the dominant influence of pharmacotherapy and the late discoveries embodied in electrotherapy. It is not so long ago that the main resources of medicine in the management of diseases other than those clearly surgical in nature consisted of drugs. Older physicians must still remember the time when the best that pharmacy had to offer was a vast number of crude galenicals.

True, pharmacy has made great strides. While the studies in bacteriology, serology and immunology have created inestimable treasures for suffering humanity, these advances are limited necessarily to certain types of affections and pathologic processes. The Hippocratic aphorism that affections not cured by medicaments can be cured by iron, that those not curable by iron can be cured by fire, could be modified today to read that affections not curable by pharmaceuticals or the knife can be greatly benefited if not healed by natural physical agents certainly much milder in effect than that of actual cauterization. If this be true, and we shall show that it is, then we must deduct that physical therapy has a field of usefulness in surgical as well as internal conditions, to which should be added that this general scope includes virtually all of the recognized specialties, be they dermatology or neurology, ophthalmology or orthopedics, and the rest of them.

* Presidential Address Delivered at the Twentieth Annual Session of the American Congress of Physical Therapy, Washington, D. C., September 2, 1941.

As a strikingly illustrative example of this thesis we need only point to the effectiveness of heliotherapy. As already alluded to, the beneficient effects of the sun's rays were realized and appreciated by primitive man, yet it was only about fifty years ago that the investigations of Oscar Bernhard and his co-pioneer, Rollier, led to the almost specific application of heliotherapy to certain forms of surgical tuberculosis. Many no doubt will remember the countless operations that have been performed to extirpate tuberculous parts of long bones with gouge, chisel and curet, operations that not rarely were extensive enough to leave only a periosteal shell as a basis for the regeneration of new bone. Who does not recall the oceans of pus following such operations for osteomyelitis, the endless dressings and the months of invalidism imposed upon the patients. Heliotherapy has changed all that to an extent and degree that there is no longer any justification for the term "surgical" tuberculosis.

Similar types of infections have been more or less successfully managed by another and even more simple measure of a physical character through the research of August Bier. This procedure led to the recognition that the fever, inflammation and swelling accompanying tuberculous and other bacterial infections were natural reactions to overcome the invader, hence desirable features which should be enhanced within certain limits rather than suppressed. The creation of passive or venous hyperemia by the comparatively simple act of throwing an elastic bandage or an inflated rubber cuff around an infected extremity has saved many patients from mutilating operations. In this regard it is not without interest to note that Bernhard, Rollier and Bier had enjoyed international reputations as surgeons when their humanitarian urge toward conservatism forced them to resort to measures that have enriched the armamentarium of physical therapy.

Again this points to another interesting fact. Hyperemia as well as irradiation by natural sun, ultraviolet or other type of light, is utilized on a physiologic, or if one desires to include the entire scope of involved research, biologic basis, so much so that there is good reason to speak of physiologic therapy. As a matter of fact, in some foreign countries, even official medicine has referred to it by the term "natural."

But, it may be held, all this does not justify specialization, since after all is said and done, the measures available can be counted on the fingers of our hands, while pharmacotherapy involves the knowledge and use of hundreds of remedies. If mere numbers should be accepted as the criterion of what is to constitute a science in contradistinction to a craft, then one may well ponder the wisdom of the adage that the young physician has fifty remedies for every disease, while the experienced practitioner has fifty diseases for each remedy. If we are to translate this lesson to apply to our theme, we may well boast of the fact that given a physician thoroughly familiar with the physiologic effects of each of the few available physical agents and, one should add, the proper technic of application, each and every such agent in his hands assumes the effectiveness of what in pharmacotherapy is spoken of as a specific.

At that it will be possible within the allotted time to mention only the salient physical measures in the practice of medicine and surgery, for which purpose the entire field of physical therapy may be grouped as mechanical and manual. While both of these groups have their greatest usefulness in the domain of therapy, it may not be amiss to point out that some of them have proved of incalculable value also as diagnostic aids. Thus the low voltage currents have been utilized by neurologists to determine the reactions of neuromuscular degeneration. This comparatively simple test has been greatly enhanced through technical progress which now provides us with the method known as chronaximetry, so that it is possible definitely to prognosticate all forms of neuromuscular dyscrasias.

Iontophoresis, too, is a procedure carried out with the galvanic current whose technic presents no great difficulties. While the therapeutic results especially in the management of acute arthritic states have been rather variable, and therefore palliative rather than curative, many conditions have been relieved when other accepted measures have proved ineffective. It is with due modesty that I refer to my own work with nasal iontophoresis, with which I have succeeded in obtaining prolonged satisfactory alleviation of the distressing symptoms of vasomotor and other forms of rhinitis.

Fifty years ago no one dreamed that electrotherapy would completely revolutionize every known form of thermotherapy. Heat has always been known for its sedative effects and was as commonly applied in hospitals as in almost every household. Hot baths, hot poultices, packs or even heated air have been gratefully accepted physical measures, the rationale of which was scientifically explained by Bier through the production of localized active or arterial hyperemia. Then came d'Arsonval's epochal discovery that high frequency currents, in spite of their tremendous velocity, could be applied to human bodies without the least harm and with the creation of heat within the deeper structures. This form of diathermy has now been almost universally displaced by short wave diathermy. In the last analysis it does not differ from any other form of externally applied heat except that in overcoming even the resistance of the bones in the body the physician has a potent remedy with which to create active hyperemia anywhere in the human system. And it is precisely owing to this biophysical characteristic that short wave diathermy has proved an invaluable agent in many conditions commonly regarded as orthopedic in nature, and last but not least in the management of that protean disease called arthritis.

Diathermy has added to operative surgery a technic if not a fully developed method of incalculable value. Today in suitable cases every surgeon can provide himself with a diathermy apparatus that will enable him to carry out the finest and most exacting dissection or extirpation of tissues in a manner offering great advantages over dissection by scalpel and destruction by the actual cautery. Enthusiastic pioneers have made all sorts of exaggerated claims for what is now commonly spoken of as electrosurgery. This technic has been in use long enough, however, to justify the assertion that it lessens trauma and therefore shock, that it acts as a hemostat for small vessels and thereby reduces the number of ligatures, and, above all, that in sealing the lymph vessels in the path of the incision it safeguards the patient against operative inoculation with malignant cells.

Neurosurgery owes it to the genius of Harvey Cushing that today no growth of any kind is removed from the central nervous system without resort to the surgical high frequency current. Urologic surgery owes it to the genius of the pioneers that intravesical tumors, including certain types of enlarged prostates, today are removed with the high frequency current introduced through a cystoscope-like instrument via the urethral canal, with excellent therapeutic results and greatly lessened morbidity and mortality. Electrosurgical methods have of late years been utilized in ophthalmology, otorhinolaryngology, gynecology and the other surgical specialties, not only for the destruction or extirpation of malignant neoplastic disease but for a variety of otherwise benign conditions. The time is not far when such a condition as detachment of the retina, to cite only one example, will be managed solely by electrosurgery.

Returning to the field of internal medicine with relation to thermotherapy, short wave diathermy has in recent years added a measure or method which has already saved a large number of individuals doomed to mental benightedness and death and restored them to years of productive, useful lives. I have reference to the so-called fever treatment of paresis. Chemotherapy could at best attain a temporary remission, but now in the majority of cases of general paralysis of the insane, one can look forward to virtually ideal results. While fever

therapy so far has limited indications, experimental work has already revealed beyond peradventure that this systemic remedy will have beneficial effects on a comparatively large variety of generalized pathologic processes.

The low voltage currents, too, have proved the means of revolutionizing the so-called shock therapy which has proved of decisively beneficial effect in dementia praecox. Thus most neurologists have already abandoned the use of the chemical preparation metrazol and similar products, and now produce transcerebral shock by a current — a procedure wholly devoid of the disadvantages if not dangers incident to the administration of chemicals.

The combination of a thermal and manual measure in one that has in the past few years attracted widespread interest is the underwater management of poliomyelitis. It would be like carrying owls to Athens to say more about this procedure than to point out that nearly every well-equipped hospital has added a suitable tank to provide underwater treatment to the unfortunates who have lost the use of their limbs by this spinal affection — proof of the virtues contained in the method.

Coming now to the purely manual measures, rest, massage and exercise have not only been rationalized but scientifically developed as most valuable corrective measures for contractures, deformities, or dysfunction of the kinetic apparatus.

At this time when selected youths of our people have been called to arms and are being prepared to face any enemy who determines to attack us, this problem of proper exercise is actually a national one. When one considers the mode of life under which our young men have carried on for years, the metamorphosis of an armed force from more than a million youths, softened by lives of ease and even dissipation of one's physical energy, is a task which will be solved only by cooperation between the responsible medical officers and those who will exercise command in actual battle. The *mens sana in corpore sano* is prime condition for that high degree of morale which enables the fighting man to endure the hardships of a campaign and to face the enemy without becoming panicky.

The Bryanistic philosophy of millions springing to arms overnight has been exploded as a myth or worse. Spartan ruggedness is not acquired through the act of donning military uniform. Experience has shown that properly trained men even of comparatively insignificant physique have stood battles with better morale and better physical endurance than the athletes trained to greater physical exertions but for only short periods.

The problem therefore lies in selecting a degree of daily exercise which should offer neither a too much nor a too little. That intervals of rest are essential is a physiologic law, but this, too, must be regulated until a development is reached which will resist prolonged states of alertness under the stress of a modern campaign. Even the question of proper nourishment is one which has long since been elaborated by modern dietotherapy. That our army authorities have made and will continue to make good use of the knowledge acquired through the study of physical medicine there is no doubt. And in this it is of little importance whether these same authorities have officially acknowledged their indebtedness to physical medicine or not, for as a legitimate branch of scientific medicine it seeks no glory but the privilege of rendering effective service.

In conclusion, may I be permitted to point out several cogent facts that have a bearing on our present national situation. War and medicine and especially surgery have always gone hand in hand. The rifleman was followed by the surgeon, the cannon in the van by ambulances. The arena of combat had as its background the spaces for lazarets. The experiences gained by surgeons in war proved of benefit to civil surgery, just as the discoveries and technical advances

of civil surgery proved of great benefit to war surgery. But, so far as physical therapy is concerned, it required the massive character and the intense disabilities produced by ordnance and implements of the first World War to see a realization of its potentialities as a corrective and reparative method for the crippling end-effects of war injuries. The armistice of 1918, therefore, can be said to be the real birthday of modern physical medicine. Though much has yet to be done and achieved, as in all arts and sciences, in the twenty-three years that have elapsed our discipline has made tremendous strides forward scientifically as well as clinically, and this Congress has played an international role in coordinating these measures on a scientific basis. This collective experience embodied in the Congress by patriotic members of the regular medical profession is at the disposal of our armed forces, now during the period of mobilization and for all time, no matter what test our man power may be fated to undergo. The systematic employment of physical measures in our military and naval hospitals will indeed prevent many deformities, lessen many days of hospitalization, and restore to the national man power as many as at all possible and at the earliest possible moment. The concerned military and naval leaders are solemnly assured of our willingness to cooperate with them to the very best of our ability and to the fullest extent under any and all circumstances.

Physical therapy has not reached the acme of perfection, but it is not at a standstill. Every year this Congress has met, it has given evidence of progress. I am sure that this year's deliberations will add to the sum total of our knowledge, and that the next and future years will prove additional milestones on the path of progress in the service of suffering humanity.

PHYSICAL THERAPY IN RELATION TO SURGERY *

HERBERT E. HIPPS, M.D., F.A.C.S.

and

BILLIE LOUISE CROOK, R.P.T.T.

MARLIN, TEXAS

The intelligent use of physical therapy is a valuable adjunct in the treatment of many surgical conditions.

Emphasis should be placed on "intelligent use." The indiscriminate use of various machines, light rays, electrical devices and other modalities on patients without the supervision of the attending physician is often of no value and may at times be actually detrimental.

Every patient who needs physical therapy should have the benefit of definite instructions from the physician to the physical therapy technician, so that the treatment can be more accurately administered.

Since it is impossible in the limited space of this paper to discuss all the surgical conditions in which physical therapy is beneficial, only two of the most important will be presented. The treatment of these two is so dependent on physical therapy as to be of limited value without it. While this has always been true, recent developments in our handling of these conditions have greatly enhanced the value of combined physical therapy and surgical procedures. The discussion of these two examples will, therefore serve not only to illustrate the dependency of one method on the other but will show how better results have been obtained through an even greater correlation between these two therapeutic methods.

Muscle Transplantations

It is the usual practice among most orthopedic surgeons to do a muscle transplantation and then have the physical therapy technician educate the patient to the use of the transplanted muscle. Even with the most painstaking care in all phases of this regimen, our results were never very good. An analysis of the results of 134 muscle transplantations done in the Crippled Children Hospital between 1934 and 1939 indicated that after twelve to eighteen months 54 per cent of the transplanted muscles were functioning unsatisfactorily. They had lost strength, were not active at all or were not contracting synergically with the action of the limb.

The basic fault seemed to lie in the fact that the transplanted muscle did not contract with the motion of the limb in the way it should have done in its new position.

Since its action had not become habitual nor synergized with the motion of the limb after the operation, several sequelae naturally followed: The patient "forgot" the muscle, and it lost strength or became completely inactive; it was stretched by the pull of the opposing muscle or it contracted at the wrong time, thus defeating the purpose for which the transplantation was done.

After this basic fault was recognized, it was largely corrected when much more attention was paid to training the muscle.

Now whenever a muscle transplantation is to be done the procedure is divided into three separate stages.

---

* From the Crippled Children Hospital.

* Read at the Southern Sectional Meeting of American Congress of Physical Therapy, Fort Worth, Texas, May 12, 1941.

First, the patient is taught to isolate the one muscle that is to be transplanted. Second, the operation is done. Third, the patient is taught to contract this newly transplanted muscle synergically with the action of the limb. Muscular contraction and relaxation must be synchronized with the motion of the limb, and the synchronized motion must become habitual.

For example, if a transplantation of the biceps femoris muscle to the patella is contemplated, the patient is taught how to contract the inner and outer hamstrings separately, and not together, as is normally and ordinarily done. When he has learned this, he will be able to contract the biceps femoris muscle independently of the other flexors of the knee, and he is then ready for the operation. The transplant is done. In two or three days the patient begins actively contracting the muscle in its new position. This prevents atrophy and serves to fix more firmly in the patient's consciousness the contraction of that individual muscle.

In three weeks the cast is removed and motion of the limb is started. Now the patient must learn to contract the biceps femoris muscle when the knee extends. The motion must develop into an automatic, habitual or involuntary contraction with extension of the knee; the motion at first becoming a part of and then actively performing extension. The patient's walking should be supervised long enough so that the newly transplanted muscle is actually an extensor and has the extensor timing involuntarily or habitually developed.

When this has been done, atrophy will not occur and the muscle will not lose strength or become "lost," since it actually functions in the new position.

This meticulous technic of preliminary training and more detailed attention to physical therapy has improved our results so much that an unsatisfactory result in the use of muscle transplantation is now rare.

Scoliosis

For the past few years the orthopedic world has been going through an era in which scoliosis in most cases has been corrected by the use of a turnbuckle jacket and the spine subsequently fused (fig. 1, *A*). As the years pass, it is seen that many spines corrected in this way return to their original deformity and that some even become worse in spite of having a heavy, strong bone graft firmly grown into place (fig. 1, *B*). Recent analyses by Steindler of the end results in cases of scoliosis show that patients who have developed compensation before the operation have retained their corrected position. Those who have not developed compensation have not retained their correction.

Compensation developed before operation thus seems to be a more important element in the retention of the corrected position than a large heavy bone graft in the spine.

It is of course known that some "force" is acting in every scoliotic patient's spine to cause the deformity. Correcting the curve and fusing the spine does not necessarily or often eliminate that deforming force. The same force, therefore, acting over a long period, can cause the sinking of even a well corrected curve held with a heavy, strong bone graft (fig. 1, *A*, *B*). Small drops of water can wear away a large stone.

When the matter is considered in this light, it is not at all inconceivable that a corrected and fused curve could recur, since the deforming force has not been eliminated.

Permanent correction, then, cannot conceivably be obtained unless the deforming force is eliminated entirely, or is combated daily and thus neutralized by an equally strong corrective force.

The realization of this fundamental concept has led us back to the teachings of Steindler. Many scoliotic spines that once would have been fused are now corrected without operation by developing counter curves above or below or both above and below the primary curve so that the spine is balanced or compensated (fig. 2, *A*, *B*).

A B

Fig. 1. — *A*, a spine that has been corrected and fused. Note the heavy, strong bone graft. This was an excellent result at first; *B*, the spine shown in *A* four years later. The graft is still strong. It has actually grown in length and thickness, but the curve has returned and is as bad as it originally was.

When a fusion seems necessary, preliminary development of compensation is a prerequisite to the operation.

In developing compensation a regimen of exercises similar to those used by other orthopedic institutions is carried out. These include "creeping" exercises, derotation work, side bending exercises, muscle setting, "shift" work and of course individual variations suitable to each patient.

We have added to these exercises what we term habit exercises and habit postures. These are designed to be an active dynamic force equal to the deforming force and one that is actively combating the deforming force for almost twenty-four hours every day.

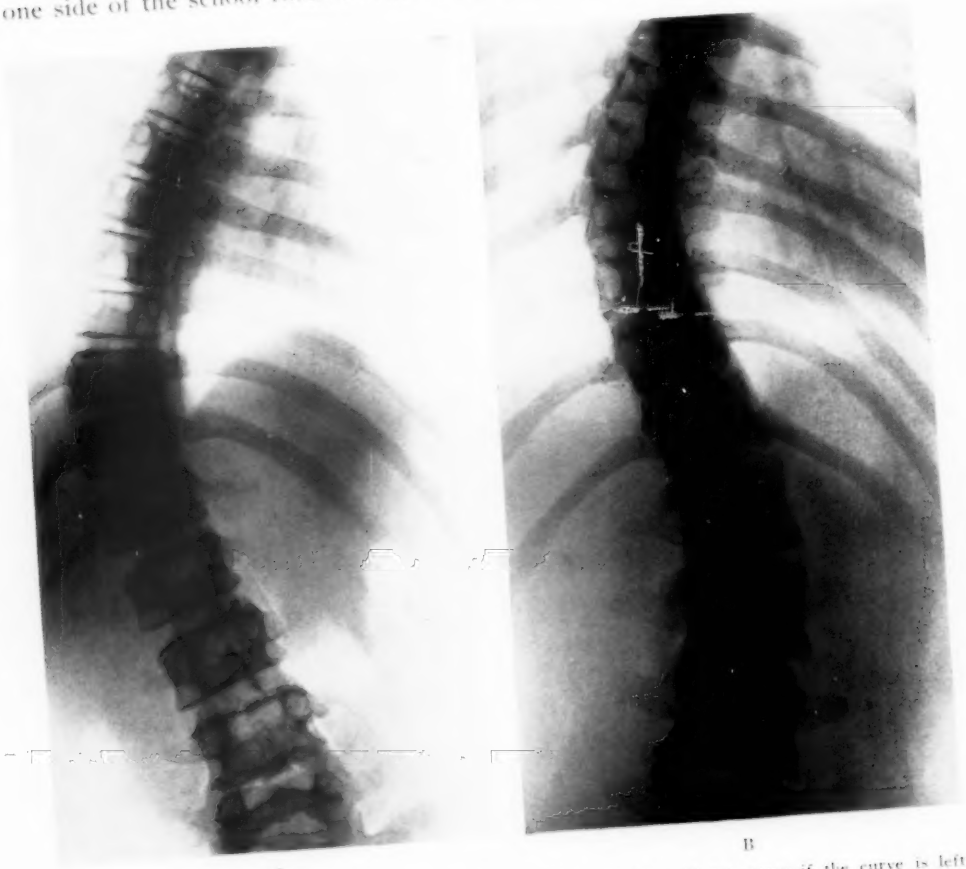
If a patient takes certain exercises every morning and every afternoon and forgets the spine for the rest of the day and night, then for about one hour of the twenty-four the corrective force has been active while for twenty-three hours the deforming force has been active and has had full control.

Obviously little headway will be made with such a program unless cumbersome braces supply the retentive force for correction the other twenty-three hours of the day.

To eliminate the brace and to develop an active force combating the curve, the habit exercises were developed.

These exercises are grouped as follows: (1) habit exercises and postures while sitting, (2) habit exercises and postures while standing, and (3) habit exercises and postures while lying down.

For example, for the first group the child's desk may be moved from one side of the school room to the other. He is taught to always sit with a



A B

Fig. 2.—*A*, a "C" curve before treatment; an unbalanced spine that will get worse if the curve is left as it is; *B*, the spine shown in *A* after treatment, showing some correction of the primary curve and the development of secondary counter curves. This spine is balanced or compensated. It is in a state of dynamic equilibrium and is not likely to sink into more deformity.

book under one side of the pelvis to tilt the pelvis and develop a counter curve in the lower part of the lumbar spine. At home the chairs he habitually sits on are altered so that every time he sits down the pelvis is tilted. His place at the dining room table may be changed. He may be taught always to reach for something with one arm.

Many more things can be worked out that will become habitual for the patient. By his forming these habits, every time he sits down the deforming force and the curve are habitually and thus constantly combated.

In standing, similar postures and habitual exercises are developed. He is taught to stand with one knee bent and the pelvis dropped down on that side.

He may be required always to carry books and other objects on one side. Walking to school with one foot on the sidewalk and the other off, to tilt the pelvis actively at every step, is helpful. In leaning against a wall, in climbing steps, in getting into a car and in many other actions he forms habits that in themselves combat the curve by an actual active force, present all the time he is standing or walking.

The bed may have to be changed from one side of the room to the other; the position of the reading light may need to be changed. The habit of lying on one side only and avoiding the other side can be developed. His posture in bed can be closely supervised, and other "lying down" habits that correct the curve can be developed.

Therefore, for almost twenty-four hours every day an active force exists that effectively combats and neutralizes the deforming force.

Since adopting this regimen we have needed to use less surgical intervention in the treatment of scoliotic spines and our results are better than they have ever been before.

Comment

This presentation serves the dual purpose of pointing out the extreme interdependence of surgery and physical therapy in the management of muscle transplantations and scoliosis and of showing how even better results were obtained by a closer coordination of the efforts of the surgeon and the physical therapy technician.

There are many other surgical problems in which a greater correlation of their respective efforts would greatly improve the end result.

There are many other conditions, both medical and surgical, for which physical therapy is not used at all and in the treatment of which much quicker and much better results could be obtained if the physical therapy technician's skill and training were employed under the supervision of the surgeon.

For many other conditions physical therapy is used but is of the "button punching" variety, in which there is a therapeutic sameness in all procedures. Such treatment savors of quackery and is seldom of actual value, and its chief therapeutic asset is its psychologic effect on the patient. How much better it would be to have not only this psychologic asset but definite improvement gained from intelligent treatment competently administered and closely supervised by the attending physician.

A few moments of conference between the physician and the physical therapy technician in every case will often yield big dividends in improved results.

AWARDS OF MERIT BY THE AMERICAN CONGRESS OF PHYSICAL THERAPY FOR THE YEAR 1941

In recognition of distinguished contributions to the medical science of physical therapy, Gold Key awards were made to four world renowned individuals by the American Congress of Physical Therapy. First of the four men was President *Franklin D. Roosevelt*, to whom a key was presented in appreciation and recognition of his long interest and support of the medical fight against infantile paralysis. The other three men singled out for their distinguished service to physical therapy were Dr. *William Bierman*, New York specialist, faculty member of New York University and attending physical therapist at Mt. Sinai hospital in New York; Dr. *W. S. C. Copeman*, eminent scientist of London, England, and honorary secretary of the British Rheumatism Association; and *Bernard M. Baruch*, noted industrialist and financier.

The awards were announced at the twentieth annual banquet of the American Congress of Physical Therapy held at The Mayflower in Washington, D. C., Wednesday evening, September 3. Dr. Norman E. Titus made the presentation of keys.

The recognition of Dr. Bierman was made because of his outstanding research in the various applications of heat for therapeutic purposes, with especial reference to his studies of the temperature of the various parts of the body and the effects of drugs and physical measures on these temperatures. Dr. Bierman's work has resulted in significant new theories and devices in the field of artificially induced fever, use of high frequency currents, and electrosurgery.

Dr. W. S. C. Copeman of London, England, author, executive, scientist, and physical therapist, was honored for his recent contribution to the advancement of physical therapy in developing a remarkable military physical therapy organization, in the field, under the most unfavorable conditions. Dr. Copeman's description of his improvisation of physical therapeutic equipment during actual warfare has so greatly impressed the American Congress of Physical Therapy that special recognition was given by the American organization to this English associate.

Bernard M. Baruch, New York financier and philanthropist now in Washington in an advisory capacity for the defense program, was cited by the Congress for his continued interest and support of this scientific field in which his father, Dr. Simon Baruch, was a pioneer physician. The award committee specifically mentioned his recent restoration of the famed Egyptian hall at Virginia Medical College in Richmond, which has become the first memorial in this country to an eminent physical therapist. Mr. Baruch was further cited for his service as chairman of the New York state committee which developed the medical program at Saratoga Springs Spa, a health center maintained by the state of New York.

ARCHIVES of PHYSICAL THERAPY
OFFICIAL PUBLICATION AMERICAN CONGRESS OF PHYSICAL THERAPY

.·. EDITORIALS .·.

THE 1941 SESSION IN HISTORIC WASHINGTON

The recent annual session in Washington of our Congress was so momentous in its historic and scientific overtones that one can but voice the general impression that it marked a new peak in the excellence of its program and strategic selection of this meeting in our national capital. Unquestionably no one is today fully qualified to record or draw an inclusive impression of the extraordinary forces and political cross-currents gathered and operating in this, the most important of all world capitals during this period of international crises. Within such a vortex a new design of heroic proportion is about to be shaped in which the deliberations of our organization no doubt will leave their indelible impress.

The Washington of 1941 is not unlike the capital which saw the tall, lanky figure of President Lincoln communing with the destiny of his national problems. Its mood has that same colorful surface quality and depth of tragic potentialities that touch every possible nuance of the mighty forces of a nation awake to the dangers on the periphery of its peaceful pursuits. The history making character of present day Washington is therefore certain not only to be appreciated by future historians but appraised for its rich mementoes. It will be as treasured for their interpretative value of a period as momentous in our history as that which is associated with the Civil War years and other like events. It is therefore not stretching vision too far to anticipate that historians will assuredly delve into every recess of its multitudinous activities and deliberations, a period in which our own Congress has so earnestly labored and contributed. It is not the Prophecy of a visionary when it is predicted that our ARCHIVES will be searched for material to interpret the cross purposes of the humanity of science against the inhumanity of psychotic forces. It is with the certainty of a realist that we predict that historians will find precious material even in our letters, diaries, old newspapers and memoirs to elucidate the opinions that then darkened our world in deepest spiritual and physical agony.

Unquestionably future chroniclers will be able far better to evaluate the historic background and inspirational consequences related to the deliberations of our twentieth annual meeting in this focal city during this epochal period than we who lack the benefit of true perspective. The glamour of Washington by day and its spell at night never were as eloquent in their stirring, emotional qualities as the one that now impressed itself on every visitor. Proximity to the glimmering of the Capitol's majestic dome, the silvery length of Washington's monument reaching toward the distant stars, the brooding statue of Lincoln on top of sixty-five steps, and the spacious White House where now another President seeks understanding and divine guidance formed an inspiring framework for the more than one thousand physicians, occupational therapists and their aides as they convened in scientific session within The Mayflower. One felt that the pomp and circumstance of our national capital once again was changing to the more serious mood of a country that sensed the unwritten and perhaps unborn events which might challenge its citizenry's very soul. And as in 1861 so now in 1941, the feeling was inescapable that Washington was hearing distant reveille and the pathos of this awakening call was now as then heard by a President in the very same mansion, with equal sadness and compassion, and with equal courage and vision.

Scientific Program.—Such is the epic now being fashioned by circum-

stances beyond our sphere of interest but within which this year's session became an historic participant. Accordingly for those not present or unable to participate it may be of value to report in broad strokes the essential and outstanding events of the program proper, hoping that its meat will the better be appreciated because of the spice of its historic background. It was a dual program but with a singleness of purpose. The Congress with its distinguished guest, the American Occupational Therapy Association, convened throughout the week ending September 7, to deliberate and exchange mutual experiences and contributions of importance to the broader sphere of physical therapy. Each provided a program that included timely papers and scientific exhibits selected for their clinical value and suggestions along accepted lines of research and scientific trends in our discipline.

Scientific Papers. — Of the 38 papers presented by the Congress and 32 by our invited guests one would have difficulty to strike a balance between mediocrity and excellence, because each report represented a scientific phase of progress and hence was exceptional in value for its realistic and objective viewpoint. They were as timely and concise as they were critical in their logical conclusions. Discussors were usually terse but informative and broadened the scope of each paper to its widest and rational limits. And no less pleasing an impression was left with the crowded audience as related to the officers presiding over these sessions. Each acted more the benevolent and wise moderator than the customary autocrat. Thus the tone of each session was both informative and intellectually stimulating, a fact best demonstrated by the presence of a large audience at the end of each session.

Despite the high scientific uniformity of all the papers read, a few were bound to stand out by virtue of their impressive content or the personal equation of the essayist, or both. In this group which lack of space permits only the mention of a few, loomed the terse presentation of Brigadier General Frank T. Hines, who pointed out the extraordinary facilities utilized by the Veterans Administration for physical therapeutic purposes. This Government service operates 93 clinics under the prescription of regular physicians, which in the month of June, 1941, alone, has given a total of 211,956 treatments to 12,625 patients by a personnel well over the 300 limit.

Outstanding as a luminous exposition which presented an all inclusive picture of the progress and purposes of physical therapy as related to contemporary problems in civilian and armed life was that by the President-Elect, Dr. A. R. Hollender. One had but to watch the tensed attention of the distinguished guests seated on the rostrum, and the rigid position of the completely filled ballroom to appreciate that the portend of his message "took hold" and held all. Honorable mention certainly must go to Dr. Frank R. Ober for a sober, objective and concrete evaluation of the care of the lame back patient. Conservative and critical, it was devoid of the two extremes with which this problem is often viewed. His was the authoritative voice that excluded radical panaceas and spoke for a rational approach. . . . And what of that major problem of patients tensed, restless and nervous that at present have found no surcease from the multiplicity of their symptoms? Even though the question is begged, its answer must await the reader when Dr. Edmund Jacobson's paper will be published in some future issue of the ARCHIVES. The problem is too big to do it justice in the space of a few words. Certain it is that its presentation will long be remembered and was a valuable investment of time spent in its long but interesting elucidation.

The Seminar. — The *bête noire* of past sessions has often been the instruction course. How to compromise with time to enrich all with an experience commensurate with their absorptive powers has been a problem with a traditional headache. In the past one often heard lecturers speaking down to their audience,

or over their heads. The result as expected was dissatisfaction because of the heterodox intellectual digestive capacity of an audience mixed in experience and purpose. By the process of trial and error the committee in charge of this practical venture met the dilemma by riding both its horns, but this under separate auspices. The instruction this year provided elementary and advanced courses and was so detailed in purpose as to fit the need, ambition and hunger of all the registered students. Thus forty-eight separate hours and topics of lecture were offered, which presented a fairly inclusive review of both the highly technical and simple problems of interest to physicians and their aides. This as hoped solved one of the most irritating problems on the annual agenda of the Congress' activities.

The Annual Dinner. — For years the annual dinner was thought to be a gesture in honor of the incoming President. Gradually it developed into a custom in which the only thing stiff was a shirt, and only the frozen finances of an organization remained cold in the heartwarming glow of a membership unified in practice and philosophy. The pursuit of happiness has been the major ideal on this occasion even if on rare occasion it overflows beyond prescribed fermentive potency, and thus good fellowship came from the depth of the heart and generously welled over smiling lips.

The credo of the evening is hail and good cheer. On this historic night one sensed that every person in this overcrowded banquet assembly was all the more alert to the solemn overtones of an historic event, because an epic in an epoch in the progress of our organization was about to be witnessed. In more than a legal sense the Congress that night attained maturity and assumed world responsibility with its obligations and burdens and heritage over physical therapy throughout the World. Europe was in travail, Great Britain in the agony of holding to its life's defenses, and no one else but we could maintain the high and aged traditions of a discipline that had as one of its many disciples no less a healer than Hippocrates who among others has carried the torch of our ancient practice throughout the ages. The mantle of world leadership in physical therapy now rests on the shoulders of our Congress, and this was silently reflected in the assured dignity and strength of conduct of its officers and elders from both platform and floor.

After an excellent dinner President Hollender assumed the duties of toastmaster, which was by no means an unhappy obligation. The speakers did an excellent job of floating their serious thoughts on the heels of some sharp witted anecdotes and upon reminiscences that stimulated a train of chuckles and even explosive laughter. Apparently all felt that they had the sanction of OPM and the privileges of Priority, and the toastmaster in tune with the festive mood played up his position of moderator so that even the witticism of long embalmed periods creaked with a spryness of (second?) childhood.

This however constituted only part of an unforgettable experience. Like the opposites of sunshine and shadow, the scene gradually became more serene when Dr. Kovács of New York, as chairman, announced the awards for scientific exhibits, and then became stilled in solemnity when Dr. Titus of New York asked for standing attention as he read the citation of the Gold Key Award to the President of the United States, Franklin Delano Roosevelt, for service rendered humanity by his unremitting labors for the prevention and cure of poliomyelitis. The long lasting applause was eloquent of the thought that welled in everyone's heart that the Congress was honored by so honoring a humanitarian, whose exemplary courage has become a byword in the most humble of homes throughout the world. If nothing else had transpired in Washington to give this session a position in the moving events of our times, this act of making the greatest figure in the history of our times an honorary member of the American Congress of Physical Therapy is an attainment certain to leave an

imprint of our historic presence in physical medicine in the most formative period of all times.

D. K.

MANIPULATION OF THE BACK

Jostes' article in the current issue of the ARCHIVES should arouse further interest in the pertinent question concerning the manipulative treatment of backache. Many competent physicians have employed manipulative procedures enthusiastically in the treatment of low backache and perhaps with good results. Manipulative procedures employed either with or without anesthesia have been in use for many years and apparently have produced good results, particularly, in England. Some of the men who have used these procedures are Harry Platt, Timbrell Fisher, Mennell, Bankhart and Bristow.

Sir Robert Jones has been quoted as having said, "There is no hidden or mystic rite in bone-setting." Lewin[1] of Chicago has concluded that the ability to manipulate is no God-given gift conferred on a few, and that manipulation is useful in cases of adhesion, contracture, unreduced dislocation and subluxation. Myers[2] has pointed out that manipulation has an appeal to reason if it is assumed that injury to the lower part of the back is followed by hemorrhage, synovitis and continued muscular spasm which allows restricting adhesions to develop between either the joints or the fascial planes of the muscles. He has further pointed out that manipulation must be followed by adequate physical therapy.

A number of cases similar to those of Cyriax[3] have been reported; he stated that he had manipulated 2,000 backs in the twenty years prior to his report, without anesthesia. In 1917, Baer[4,5] forcibly manipulated the backs of 100 patients, with beneficial effects. In 1930, Richies[6] reported that manipulation done with the patients under the influence of nitrous oxide-ether anesthesia was successful in about 90 per cent of thirty cases of chronic back strain and twenty-five cases of what was called "sacro-iliac strain." In 1937, Troedsson[7] reported that 100 per cent prompt relief followed repeated forcible extension of one lower extremity or both lower extremities in nine cases of lumbosacral derangement (which he believed was due to minute subluxation of one or both of the inferior articular surfaces of the fifth lumbar vertebrae).

The University of Toronto became sufficiently interested in manipulative procedures in general to delegate one of their younger physicians to go to England to study these procedures under Mennell and his associates. This physician now teaches manipulative procedures to the undergraduate students of the university and conducts a rather large department of physical therapy in which manipulation is done to a considerable extent both at the clinic and at the general hospital. Mennell's procedures are similar to those of Jostes, with the exception that Mennell carries out very extensive preliminary examination; in fact, his examinations constitute almost a manipulative procedure in themselves, and finally, when the diagnosis is made, manipulation is carried out only in the localized region in which he considers that the subluxation or strain exists.

As suggested by the title of Jostes' paper, it is not a complete résumé of the work that he has done. For nine years he has been using manipulative procedures for various conditions of the lower part of the back, and he wrote[8] that he has treated several hundred patients. He likewise has done considerable work on the anatomy of the back and the physiology of manipulation. He has motion pictures which show the various movements that he is able

to obtain by manipulation of the back of a cadaver. Likewise, he has an excellent motion picture of the manipulative procedures themselves and of the post-treatment care of a patient. Possibly one of the most important things that Jostes carries out in the treatment of his patients is the post-manipulative care with rest, instruction of the patient as to how to move in bed and out of bed and how the patient is to carry on his activities after he has left the hospital.

Nearly all authors, in writing about disabilities of the lower part of the back and manipulation, stress postural training and corrective exercises, and point out the extreme importance of such measures in treatment. Those who practice industrial medicine are beginning to realize that there is need to instruct their patients concerning the prevention of recurrence of these conditions of the back, and in many industrial plants there will be found pictures for the guidance of employees, of the proper way to pick up heavy objects without straining the back. Despite many reports made concerning manipulative procedures, there are numerous anatomists as well as clinicians who believe that there is little evidence that "adhesions" exist and that there is such a thing as a "subluxation." None of these things have been proved to the satisfaction of everyone. No less an authority than the late Willis Campbell[7] expressed doubt that sacro-iliac separation or relaxation really exists except in association with severe injury or, rarely, for a short period in women during pregnancy. In nearly every medical school students are taught that it is impossible to cause dislocation of the vertebrae or the sacro-iliac joint without severe trauma or injury. Therefore, the reasons that manipulative procedures for pain in the lower part of the back have been "far too long neglected" are: (1) sufficient experimental evidence is not available to show that the conditions for which manipulation is supposed to be used actually occur, (2) these procedures have not reached their full usefulness, possibly because of the fact that they resemble the procedures used by certain irregular practitioners, and (3) most of the reports that have been made are not accompanied by controlled studies of the same condition. The statements, "so many patients were treated with 100 per cent relief," "thousands of patients achieved good results," and others, such as one made by Jostes in one of his articles[8]: "the technic evolved over a period of nine years has been successfully used in several hundred cases," do not prove definitely to the profession that what is said about the value of manipulation is true. It certainly seems that many more studies in relation to the anatomy of the back and the physiology and pathology of conditions of the lower part of the back will have to be made before these procedures will be widely recognized by members of the medical profession.

Likewise, these procedures probably would be more widely accepted and these reports by various excellent workers would be more fairly received, if the series of cases reported were controlled, so to speak, and, also, if the statistics offered were broken down to explain what the conditions were that were treated, as has been attempted by Jostes in his reports on the patients he has treated. The questions arise as to whether or not rest in bed, the use of a hard bed as suggested by Jostes, the widely accepted corrective exercises, heat, massage, and the use of supports, would not do as well in the treatment of these patients as manipulation. It is admitted that considerable progress has been made in the diagnosis and treatment of conditions of the lower part of the back in the past several years; still, the physical diagnosis cannot be overemphasized and still more work should be done, more emphasis should be placed on the problem and more care should be used to determine the cause of pain in the lower back. Therefore, the exact value of manipulation in chronic postural backache or other back conditions will

not be settled until further study has been done, and until more exact details can be given as to whether or not the conditions for which manipulation has been said to be of value actually exist. Certainly, such papers as the one of Jostes and some of the others that have been written should arouse the interest of members of the medical profession and of research workers to discover whether or not these procedures are as valuable as they would seem to be.

References

1. Lewin, Philip: Manipulative Surgery, with Special Reference to Low Back Pain and Symptomatic "Sciatica," S. Clin. North America **16**:113 (Feb.) 1936.

2. Myers, E. E.: Conservative Treatment of Low Back Pain, Physiotherapy Rev. **17**:100 (May-June) 1937.

3. Cyriax, E. F.: Quoted by Gray, Horace.

4. Baer, J. L.: Quoted by Gray, Horace.

5. Gray, Horace: Sacro-iliac Joint Pain: I. The Finer Anatomy, Internat. Clin. **2**:54; II. Mobility and Axis of Rotation, 65; III. Etiology, Diagnosis and Treatment by Manipulation, 77 (June) 1938.

6. Richies, E. W.: End-results of Manipulation of the Back, Lancet **1**:957 (May 3) 1930.

7. Troedsson, B. S.: Lumbosacral Derangement and Its Manipulative Treatment, Arch. Phys. Therapy **18**:10 (Jan.) 1937.

8. Jostes, F. A.: Backache. In Barr, D. P.: Modern Medical Therapy in General Practice. Baltimore, Maryland, Williams & Wilkins Company, 1940, vol. 3, pp. 3397-3430.

9. Campbell, Willis C.: Quoted by Lewin, Philip.

ADDRESS OF WELCOME TO THE 20TH ANNUAL CONVENTION OF THE AMERICAN CONGRESS OF PHYSICAL THERAPY

It is a great pleasure, Mr. Chairman, to be with you this evening, and to share the honor of welcoming your members to our National Capital.

As many of you are aware, we have employed Physical Therapy at our Veterans Administration Hospitals and out-patient stations for many years. It has proved to be an important adjunct of our medical and surgical treatment. We have at present 93 Physical Therapy clinics, at which about 250,000 treatments are given to 12,000 veterans each month.

We now have 279 Physical Therapy technicians in our hospitals, and the selection of this personnel is based upon the high standards set up by the Congress of Physical Therapy.

The favorable results we have obtained are shown by the fact that the number of our Physical Therapy clinics and treatments have been increased by about one-third during the past 10 years.

As for Occupational Therapy, more than 14,000 of our patients were engaged during last June in Occupational Therapy projects in 52 of our hospitals.

At 9 o'clock on Thursday morning, September 4, we plan to have a program of one and one-half hours for the discussion of the value of Occupational Therapy and the results obtained in Veterans Administration Hospitals. This will be held here in the Hotel ballroom, and I hope that you may find time to attend, as a number of papers will be read by personnel who are especially interested in the demonstration and direction of this type of treatment.

I hope you may also have the opportunity of inspecting our two exhibits here at the Hotel. One is an Occupational Therapy Exhibit — where Occupational Therapy, as practiced in one of our General Medical and Surgical Hospitals, is demonstrated — also as it is employed in Nurses' training. Our other Exhibit is concerned with Physical Therapy in Veterans Administration Hospitals.

A fever therapy center is being established at our Northport, L. I. Hospital which will be used for the treatment of patients, as well as for the training of personnel from other stations, in the best methods of applying this therapy.

It is not my purpose this evening to discuss the medical aspects of Physical Therapy and Occupational Therapy, but rather to welcome you to Washington and to express the hope that your visit here may prove to be both pleasant and instructive.

I know from personal experience that the exchange of opinions and methods among members of an organization such as yours, is frequently helpful to all—and in the end should be beneficial to the patients in whose interest these gatherings are primarily intended.

I am sure you will find Washington a pleasant city to visit from both an historical and a scenic viewpoint. With many of you, quite naturally, Washington is an old story—but like an old friend, pleasant to meet again after an absence.

Mr. Chairman, I appreciate very much having been invited to be with you this evening.

Brigadier General Frank T. Hines,
Administrator of Veterans Affairs, Washington, D. C.

ADDRESS OF WELCOME TO THE 20TH ANNUAL CONVENTION OF THE AMERICAN CONGRESS OF PHYSICAL THERAPY

It is a great privilege to extend to you a most cordial welcome to this busy capital. You will find here some preoccupation with the pressing tasks of national defense. Even the processes of medical education have increased their tempo in response to the demands of the times. In spite of this, there is under it all a warm professional regard and recognition of the significance of this meeting of your specialty in aiding in the solution of problems of common interest.

A few brief remarks concerning some mutual and rather widely discussed problems of our respective medical interests might not be amiss.

From earliest times, physical techniques of treatments have advanced side by side with other agents that make up the armamentarium of the modern physician. In spite of this advancement and scientific attainment, physical therapy has not always played its deserved role in modern medicine.

I believe it is a fair statement that the medical profession in general has failed to avail itself fully of the valuable adjuncts of physical therapy.

The numerous modalities of this type of therapy have been neglected by many of our medical men. Many valuable aids in the cure or amelioration of disease have been lost as a result. Such an attitude has rendered the sufferer and the physiotherapist a grave injustice. When other measures have been exhausted, patients appeal to irregular unqualified practitioners with their smattering of the principles of the physical therapeutic technique, often with dire results.

Thus, untutored, unscientific and irregular healers have invaded the province of ethical medicine. The profession has a grave responsibility to the individual patient and can discharge it only when every available scientific method of treatment is employed. Hence, every practicing physician should be well acquainted with the usefulness of physiotherapy methods. Through organizations such as yours, this essential liaison between the physician and the physiotherapist can be established with great benefits to the individual patient.

Undoubtedly, education in physical medicine in America has failed to make such impression on most medical curricula. I believe we have failed in the past to give the average medical student an adequate or clear view of this important field of medicine. Although the medical curriculum is crowded, it would seem reasonable and logical to provide more and better undergraduate instruction in this important branch of therapy. Because of my interest in medical education, I feel at liberty to make this criticism. Only from the centers of medical education with adequate instruction in this field will come new graduates well founded in all branches of therapeutics and qualified to apply the advantages of physical treatment.

You are the representatives of a scientific group whose members are destined to play an ever broadening role in medicine. The limits of your field of endeavor are wide. Through the maintenance of high standards of personal qualifications, the service you render will be of the highest type.

The medical profession needs you. The demands of this present critical period calling forth the energies of the greatest mass of medical workers in this country will make increasing demands on your services. In your hands will be placed the rehabilitation of the injured worker and, in time of war, the restoration to normal life of the wounded soldier.

I deeply appreciate the opportunity offered by your program committee of welcoming the Association and of bringing you our best wishes for a profitable and inspiring session.

WALTER A. BLOEDORN, M.D., Dean,
The George Washington University School of Medicine,
Washington, D. C.

AWARDS TO SCIENTIFIC EXHIBITORS

Awards of merit for outstanding scientific exhibits on display this week at the American Congress of Physical Therapy were also announced by Dr. Richard Kovács. The awards were as follows:

Gold Medal: The exhibit of Dr. *O. Leonard Huddleston* and *Clayton S. White*, M.S., of the University of Colorado, Denver, demonstrating experimental studies on the chemical transmission of nervous impulses of the sciatic nerves.

Silver Medal: The exhibit of Dr. *K. G. Hansson*, Dr. *B. S. Troedsson*, and *Erich Schwarzkopf*, Ph.D., of New York Hospital. This exhibit, sponsored by the National Foundation for Infantile Paralysis, is a demonstration of equipment and methods for the measuring of muscle conditions as affected by infantile paralysis.

Honorable Mention: The exhibit of the *District of Columbia Health Department*, Bureau of Maternal and Child Welfare, Handicapped Children's Unit, Washington, D. C. The exhibit is concerned with postural deformities of children, including knock knees, round backs, and apparatus for use in corrective treatment.

Honorable Mention: The exhibit of the *Veterans' Administration*, Washington, D. C., describing use of physical therapy in veterans' administration hospitals. Miss *Alice L. Baker* was responsible for the planning and execution of this exhibit.

Honorable Mention: The exhibit of *William Firth Wells*, and Dr. *Mildred Weeks Wells* of the University of Pennsylvania School of Medicine in Philadelphia. This exhibit is concerned with ultraviolet, indirect irradiation of room air for purposes of destroying micro-organisms. It describes the methods of preventing and controlling air-borne infections through the use of indirect ultraviolet light.

MEDICAL NEWS

Officers for 1942
American Congress of Physical Therapy

President
A. R. Hollender, M.D.
Miami Beach, Fla.

President-Elect
Fred B. Moor, M.D.
Los Angeles

First Vice-President
Kristian G. Hansson, M.D.
New York

Second Vice-President
Miland E. Knapp, M.D.
Minneapolis

Third Vice-President
Walter S. McClellan, M.D.
Saratoga Springs, N. Y.

Fourth Vice-President
H. Worley Kendell, M.D.
Dayton, Ohio

Fifth Vice-President
Kenneth Phillips, M.D.
Miami, Fla.

Secretary
Richard Kovács, M.D.
New York

Treasurer
John S. Coulter, M.D.
Chicago

Executive Director
Walter J. Zeiter, M.D.
Cleveland

Executive Secretary
Marion G. Smith, B.Sc.
Chicago

Society of Physical Therapy Physicians New Officers, 1942

President — F. H. Krusen, M.D., Rochester, Minn.

President-Elect — K. G. Hansson, M.D., New York City.

Vice-President — William H. Schmidt, M.D., Philadelphia.

Secretary-Treasurer — Milton G. Schmitt, M.D., Chicago.

Membership Committee — Disraeli Kobak, M.D., Chicago; Jerome Weiss, M.D., New York City; William H. Schmidt, M.D., Philadelphia; Nathan H. Polmer, M.D., New Orleans; Miland E. Knapp, M.D., Minneapolis.

Program Committee — Madge C. L. McGuinness, M.D., New York City; Richard Kovács, M.D., New York City; Frances Baker, M.D., San Francisco.

New York University Opens New Course for Physical Therapy Technicians

New York University announces the opening of a course for physical therapy technicians to start with the academic year September, 1941-1942.

The School of Education, in cooperation with the College of Medicine, is offering to qualified persons courses of study in the science and art of physical therapy. The program of courses will follow that approved of by the Council on Medical Education and Hospitals of the American Medical Association. The number of students admitted to the course is limited to twenty. The length of the course is nine months. The hospitals included in the teaching program include the Hospital for Joint Diseases, The Mount Sinai Hospital and the Institute for the Crippled and Disabled.

Students must meet one of the following requirements: (1) graduation from an accredited school of physical education, (2) graduation from an accredited school of nursing, (3) two years of college work, including courses in biology and physics.

The courses are given University credit and there are three possible plans which may be followed: (1) Certification as a physical therapy technician can be obtained by completing the nine months' program of courses. (2) Students completing the certification requirements may continue their studies and receive the Bachelor of Science degree. (3) Graduate students may matriculate for the Master of Arts degree.

The Clinical Director of the course is William Bierman, A.B., M.D. The Curriculum Director is George G. Deaver, B.P.E., M.D.

National Society for Crippled Children to Meet in Louisville

The National Society for Crippled Children will this year celebrate its 21st annual convention in Louisville, with the Kentucky Society as its host at the Brown Hotel, October 4 to 8. Among the speakers at the meeting will be:

Miss Katharine F. Lenroot, Chief, Children's Bureau, U. S. Department of Labor, Washington, D. C., State and Community Planning for the Crippled Child.

W. Barnett Owen, M.D., and K. Armand Fischer, M.D., Louisville, Evaluation of Physical Therapy.

Alan DeForest Smith, M.D., New York, Present

Status of the Treatment of Bone and Joint Tuberculosis.

R. B. Raney, M.D., Durham, N. C., Prevention of Deformity.

Warren K. Layton, Detroit, Outlining a Guidance Program.

H. Earle Correvont, Lansing, Mich., The Golden Opportunity for Rehabilitation.

Of special interest this year is the 200-mile bus trip through the Blue Grass Region around Lexington which has been arranged by the Kentucky Society at a nominal cost of $2.75 round trip.

Further information may be obtained from Mr. E. W. Palmer, President of the National Society for Crippled Children, Elyria, Ohio.

Council Approval for Emergency Courses

For the duration of the emergency the Council on Medical Education and Hospitals has extended its approval for the emergency courses for physical therapy technicians to the following schools: Stanford University, Walter Reed General Hospital, Northwestern University Medical School, University of Buffalo, and Children's Hospital, Los Angeles, California.

Approved Residencies In Physical Therapy

The Council on Medical Education and Hospitals of the American Medical Association announces in the Journal of the American Medical Association, August 30, 1941, the institutions approved by the Council which are considered in position to furnish acceptable training in various specialties. Residencies in specialties, as defined by the Council, are straight services of one or more years following an approved internship. A fellowship is a form of apprenticeship which in some cases is indistinguishable from a residency, although it usually offers greater opportunity for the study of basic sciences and research. Ordinarily a fellowship is a university rather than a hospital appointment. In physical therapy there are the following approved residencies and fellowships.

Stanford University Hospitals, San Francisco; W. Northway, M.D., chief of service; 2,751 inpatients treated; 5,073 outpatient visits; one residency beginning July 1 for one year with a beginning stipend of $25.

Michael Reese Hospital, Chicago; C. O. Molander, M.D., chief of service; 394 inpatients treated; 5,200 outpatient visits; one residency beginning July 1, lasting one year, with no stipend.

The Mayo Foundation for Medical Education and Research, Rochester, Minnesota; D. C. Balfour, M.D., director; three-year fellowships, beginning quarterly, leading to the degree of M.S. or Ph.D. with field named from the University of Minnesota; stipend $900 per year; F. H. Krusen, M.D., chief of the Section on Physical Therapy.

Boston Emergency Physical Therapy Training Course for Defense

Under the combined auspices of the Harvard Medical School courses for graduates, Bouvé-Boston School of Physical Education, and Boston University—Sargent College School of Physical Education a defense course started September 2nd, 1941 for six months. This course is of 1030 hours of lectures and clinic practice in Boston hospitals. The faculty is that of the schools mentioned and also is drawn from the Harvard, Boston University and Tufts Medical Schools. Approximately 35 students are enrolled in the army course in addition to the usual 9 months' civilian courses which will graduate about 60 technicians in June. This 6 months' course is planned to be repeated starting March first.

Dr. Storms Heads Workmen's Compensation Board Clinic at Toronto, Canada

One of the new members of the Congress is Dr. Harold Storms of Toronto, Canada. An interesting account of how injured workmen are rehabilitated by Dr. Storms is found in *Saturday Night*, a Canadian weekly, in its issue of August 30, 1941, in which is described extensively the work of the clinic of the Workmen's Compensation Board at Toronto of which Dr. Storms is director.

The article states that it was Dr. Storms who with Dr. D. E. Bell, chief medical officer of the Compensation Board, was responsible for the establishment of this city-block-long clinic in downtown Toronto, where from 90 to 120 patients receive treatment daily. Each patient treated at the clinic is a workman who has a disability resulting from an industrial accident. All patients have been treated by their own doctors, but each is suffering in some way as the result of the accident. Much attention is paid to all forms of calisthenics and games which are calculated to exercise a group of muscles which will be used when the patient returns to his regular job. There are facilities for occupational therapy. The prime purpose of the clinic is to cut down disability time, to try to shorten the time a man is off from his work.

Dr. Boynton to Address Medical Society of Virginia

At the annual meeting of the Medical Society of Virginia to be held at Virginia Beach, October 6 to 8, 1941, a paper on "The Use of Heat in General Practice" will be presented by Dr. Ben L. Boynton who is Director of the Physical Therapy Department of Norfolk General Hospital in Norfolk and Instructor in Physical Therapy at the Medical College of Virginia, Richmond.

Physical Therapy In Illinois

Dr. Charles H. Phifer as President of the Illinois State Medical Society has appointed the following Committee on Physical Therapy: Dr. Milton G. Schmitt, Chicago, Chairman; Dr. Andy Hall, Mt. Vernon; Dr. John S. Coulter, Chicago; Dr. Daniel H. Levinthal, Chicago; Dr. Rudolph Mroz, Rockford and Dr. E. Flinn, Decatur. This Committee will be responsible for furnishing for the *Illinois Medical Journal* a column on physical therapy abstracts.

Dr. Harold M. Camp has been appointed Editor of the *Illinois Medical Journal* and the new Editorial Board of this Journal is composed of the following: Dr. James H. Hutton, Dr. Frederick H. Falls, Dr. Josiah J. Moore, Dr. Edwin M. Miller, Dr. Chauncey C. Maher, Dr. Harry S. Gradle, Dr. Philip H. Kreuscher and Dr. Harry Culver, all of Chicago.

American Conference on Industrial Health

Under the auspices of the American Association of Industrial Physicians and Surgeons the American Conference on Industrial Health will hold its Second Annual Meeting on November 5 and 6, 1941, at Chicago Towers, Chicago, Illinois. This organization maintains a public forum for all who are interested in the prevention of disease, injury and disability in industry, and the active supervision and promotion of health in industrial groups.

The opening session will be a symposium on the technical problems of industrial health on the basis that health supervision in industry involves two great principles: (1) the adjustment of the working environment to the employee; and (2) the adjustment of the employee to the working environment, including also the human environment. The technical problems are the result of the application of these principles, and run the whole gamut of public health as applied to industry.

The afternoon session will be a symposium on the economics of industrial health, including: (1) organization and cost of a health service, and (2) discussion on the value of industrial health service to the employer, the employee and the public.

The morning of the second day will be given over to a symposium on the social implications of industrial health, discussing how far an industrial health service should go; are hospital and medical care plans related to industrial health service in any practical way; does legislation play a part in this problem; and the evaluation of labor turnover, spoilage, and lack of trained men, together with the experiences of management and the interests of insurance carriers in the medical and social problems presented.

The sessions will close with a schedule of plant medical department inspections, by special arrangements with local industries.

Military Surgeons Meeting, October 29th-November 1st, Brown Hotel, Louisville, Ky.

One of the most timely and interesting medical meetings of this year is that of The Association of Military Surgeons of the United States to be held October 29th-November 1st at the Brown Hotel, Louisville, Ky. All members of the medical profession are invited to attend as guests and it is particularly hoped that as many members of the Medical Defense Committees as possible will come.

War medicine and surgery has changed considerably since the previous emergency. Mechanization of armies and air bombardments have created new and difficult problems in traumatic surgery and methods of treatments of wounds and extreme abrasions.

For every member of the profession who can be present at this meeting there will be something of special interest. The session concludes with a mass review of Military Medicine and an inspection of Fort Knox.

Through the Chairman of the Program Committee for the Louisville meeting, Major General Charles R. Reynolds, it is possible to give a preliminary tentative program of professional sessions of that meeting. Arrangement of a schedule of papers has not yet been made. The following is a tentative list of the speakers of the meeting, with titles as far as they have been announced:

Colonel Harold D. Corbusier, Medical Reserve, U. S. Army, "Presidential Address."

Rear Admiral Ross T. McIntire, Surgeon General of the Navy, "Policies and Activities of the Medical Department of the United States Navy in the Present National Emergency."

Dr. Warren F. Draper, Assistant to the Surgeon General, U. S. Public Health Service, "Present Policies and Activities of the United States Public Health Service."

Brigadier General Frank T. Hines, Administrator of Veterans' Affairs, "Progress of the Part the Veterans' Administration Is Playing in the National Defense Program."

Major Frank B. Wakeman, Medical Corps, U. S. Army, representing Major General James C. Magee, Surgeon General, U. S. Army, "Present Policies and Activities of the Medical Department of the United States Army."

Colonel Robert H. Duenner, Medical Corps, U. S. Army, Fort Knox, Ky., "Medical Service of the Mechanized Forces."

Colonel Paul E. Howe, Sanitary Corps, U. S. Army, "Nutritional Problems of the Army."

Colonel Fred H. Albee, Medical Reserve, U. S. Army, "Treatment of Ununited Fractures of Importance to the Military Service."

Captain Lucius W. Johnson, Medical Corps, U. S. Navy, "Medical Service at Remote Naval Bases."

Captain William L. Mann, Jr., Medical Corps, U. S. Navy, "Medical Arrangements for Combined Operations of Land Forces and Sea Forces" (with motion pictures).

The following are scheduled for papers, the titles of which are not yet available.

Major General C. R. Reynolds, U. S. Army Ret.; Brigadier General Leigh C. Fairbank, Assistant to the Surgeon General, U. S. Army; Colonel Irvin Abell, of Louisville, Ky.; Colonel Leonard C. Rowntree, Medical Reserve, U. S. Army, Chief, Medical Division, Selective Service System, Washington, D. C.; Colonel Raymond A. Kelser, Veterinary Corps, U. S. Army; Lieut. Colonel David N. W. Grant, Medical Corps, U. S. Army, Office of the Chief of the Air Corps.

Supersonic "Death Ray" Proves Able to Cause Brain Fatigue

A death ray developed by an American naval officer — it kills bacteria at a distance of six inches — can cause mental fatigue in humans, it was revealed today.

It is a magnetic device which produces 9,300 vibrations a second. This frequency is just within the upper limit of human hearing. It produces an extremely high-pitched shriek which can be heard a block away. There are several other types of vibrator which can kill microscopic life at short distances.

The machine was built by Commander A. P. Krueger, head of the Navy's first mobile medical research unit.

Individuals who stand close to the machine longer than a few minutes at a time become mentally weary, Commander Krueger said. They lose some of their ability to do mathematical problems. This effect persists for several hours. — *N. Y. Times*, Sept. 2, 1941.

Services for Crippled Children Under the Social Security Act

In a recent Bureau Publication (Number 258) of the United States Department of Labor, (Frances Perkins, Secretary), Katharine F. Lenroot, Chief of the Children's Bureau, states that the year 1936 marked the beginning of a new stage in the care of crippled children in the United States. Federal grants for services for crippled children under the Social Security Act (approved August 14, 1935), totaling approximately $732,500, went to the States for expenditure during the 5-month period ending June 30, 1936.

According to the terms of the Social Security Act of 1935, the Secretary of Labor allotted to the States the annual appropriation on the basis of $20,000 to each State and the remainder according to the need of each State as determined after consideration of the number of crippled children in each State in need of service and the cost of furnishing service.

The States promptly took the necessary action to take advantage of the cooperation offered by the Federal Government. Most of the States found it necessary either to create an official crippled children's agency to administer the crippled children's program or to reorganize and strengthen an existing public agency. By June 30, 1937, every State had designated a State agency to administer crippled children's services. By March 24, 1939, every State had obtained the approval of the Chief of the Children's Bureau, as required by the act, for its State plan for services for crippled children and was matching in whole or in part the Federal funds offered for this purpose.

The steady expansion of the program is shown by the increase in Federal payments to the States for each fiscal year. As the Federal grants were matched by State expenditures for services for crippled children, the total expenditure each year was at least twice the Federal payments. The total expenditure — Federal and State — for the fiscal year 1939 amounted to approximately $6,000,000.

The principal responsibilities of the State crippled children's agencies are: (1) To locate children in need of care and to maintain a State register of crippled children; (2) to arrange for the diagnosis and treatment of crippled children at permanent clinic centers or, in sections of the State where there are no permanent centers, at itinerant clinics; (3) to arrange for surgical and medical care by orthopedic surgeons and physicians at selected hospitals; (4) to arrange for treatment and care for children living at home, who do not need operative care or treatment in a hospital; (5) to place children, when necessary, in convalescent homes or foster homes; (6) to provide or arrange for physical therapy treatments when indicated, after the child has returned home; (7) to provide public health nursing and medical-social services to the family for the purpose of continuing the care of the child and helping him to make a social adjustment in the family, at school, and in the neighborhood; and (8) to refer the child for training to the State vocational-rehabilitation service.

A physical therapy technician of the State staff in a few States supervises the physical therapy treatments given under medical direction to children at home and the physical therapy instruction given to public-health nurses and to parents. Because the number in local areas is limited, some of the State agencies have found it necessary to employ physical therapy technicians and place them in districts to give direct service to crippled children, in addition to giving instruction to nurses and parents.

The Children's Bureau believes that the best place for a child to convalesce is his own home provided that home is satisfactory for his care. If the home is not equipped to provide for the needs of the crippled child during the convalescent period, first consideration should be given to augmenting the resources in the home to meet these needs. Such provision may be in the form of increased family income, additional household equipment, additional (personal) assistance in the home, or instruction of the parents so that they will fully understand how to care for the child. A home may be satisfactory from all points of view except that it is removed from a source of medical, nursing or physical therapy service.

If convalescence must be provided for outside the child's own home, the choice of convalescent home or foster home is based on the child's need. Occupational therapy activities in the hospital and the convalescent home are an important factor in aftercare services. Vocational training for the crippled boy or girl 16 years of age or over is now available in every State through the State vocational-rehabilitation service.

Government Needs Physical Therapy Technicians

The United States Civil Service Commission, Washington, D. C., on August 1, 1941, sent the following letter:

The Civil Service Commission has been receiving the valuable cooperation of schools and hospitals in

publicizing the Government's need for persons qualified in the medical field to fill important National Defense positions. It is believed that the schools approved for training Physical Therapy Technicians by the Council on Medical Education and Hospitals may be in a position to assist in a recruiting program now in progress for Physiotherapists.

The War Department is in urgent need of students for enrollment in the position of Student Physiotherapy Aide at the Army Medical Center in Washington, D. C. Needed also are Apprentice Physiotherapy Aides for positions in the Army Hospitals throughout the United States. To qualify for appointment to the training course for Student Physiotherapy Aides, applicants must have completed a 4-year course in an accredited school of physical education, or other recognized university or college with major study in physical education. The courses must have included at least 50-class hours in each of the following: Human anatomy, human physiology, and human kinesiology. Under certain conditions, applications will be accepted from senior students. For appointment to Apprentice Aide positions, applicants must have completed or now be registered and taking courses looking toward the completion of the full special condensed course leading to graduation from a school of physiotherapy meeting the standards established for the duration of the emergency by the American Medical Association.

Student Physiotherapy Aides are offered a condensed 6 months' training course. After the successful completion of such a course, persons will be assigned to duty as Apprentice Physiotherapy Aides in an Army Hospital for another 6 months' training period. Persons successfully completing this training, and persons originally appointed Apprentice Aides, will be granted certificates of graduation and will have the opportunity to take a promotional test for appointment to positions as Physiotherapy Aide at $1,800 a year.

United States Civil Service Examinations Circular No. 117 (Unassembled) gives details of the requirements for these positions. A highly important amendment to this examination announcement has just been issued as of August 28, 1941 — the age limit has been changed so that, effective immediately, applications will be accepted from persons who have not passed their forty-fifth birthday on the date their applications are received, if those applicants meet the other requirements specified in the announcement. This circular and application forms can be obtained from the United States Civil Service Commission, Washington, D. C.

Dr. Castro Special Guest at Congress Session

Dr. Trino Castro attended the recent session of the Congress, Washington, D. C., as an official representative of the Venezuelan Government. Dr. Castro, chief of the Traumatologic and Orthopedic service of the Naval and Military Hospital of Caracas, is director of the Venezuelan Foundation to Combat Infantile Paralysis. The Venezuelan organization was recently created as the first institution of its kind in South America.

Dr. Myers Honored

Word has been received in the office of the Congress that Dr. John L. Myers of Kansas City, Missouri, was recently honored by the Kansas City Society of Ophthalmology and Otolaryngology by the presentation of a gold medal as a mark of appreciation of his work in this society. Dr. Myers has been a member of the American Congress of Physical Therapy for many years and his colleagues join in congratulating him on this greatest honor.

Resolution

WHEREAS, The untimely passing of Egbert Von Lepel on April 7th, 1941, has removed a familiar figure from the physical therapy industry, and

WHEREAS, The Physical Therapy Manufacturers Group of the American Surgical Trade Association wishes to express and perpetuate its collective regrets.

Now, Therefore Be It Resolved, That such expression shall be incorporated in the minutes of the Group, and a copy be furnished the bereaved family. Further, a copy shall be forwarded to the American Congress of Physical Therapy for publication in its official journal.

Physical Therapy Manufacturers Group
of
American Surgical Trade Association.

BOOK REVIEWS

THE INJURED BACK AND ITS TREATMENT. Edited by *John D. Ellis*, M.D., Chicago. Contributors: *H. Earle Conwell*, M.D., F.A.C.S., Orthopedic Surgeon for the Tennessee Coal, Iron and Railroad Company, Birmingham, Alabama, and Employees' Hospital, Fairfield, Alabama; *Loyal Davis*, M.D., Chicago; *Nathan S. Davis*, III, A.B., M.D., F.A.C.P., Assistant Professor of Medicine, Northwestern University Medical School; *John D. Ellis*, M.D., Chicago; *Ralph K. Ghormley*, M.D., Section on Orthopedic Surgery, The Mayo Clinic, Rochester, Minnesota; *Hale A. Haven*, M.D., Seattle; Prof. Sir *Arthur Keith*, F.R.C.S., F.R.S., London; and *Robert B. Osgood*, M.D., John Ball and Buckminster Brown, Professor (Emeritus) of Orthopaedic Surgery, Harvard Medical School, Boston, Massachusetts. Cloth. Pp. 377 with 156 illustrations and 5 tables. Price, $5.50. Springfield, Illinois: Charles C. Thomas, 1940.

Inasmuch as this volume is a compilation of several papers written independently by several authors, some inconsistencies and varied opinions appear concerning the same subject. These may perhaps be considered to be assets, since as a result the subject is not presented in a dogmatic manner. Also, due to the fact that this book is an assemblage of the works of several authors, it is inclined to be disorganized in arrangement, since the various chapters have no logical sequence when the cause, diagnosis and treatment of the injured back are considered. Each chapter, however, is a valuable contribution in itself and should be considered separately. The chapter by Sir Arthur Keith is a brief and illuminating discourse on the present stage in the evolution of the posture of man. He describes numerous anomalies of the human skeleton and compares them with the skeletons of the higher apes, thus attempting to show that the present posture of man is not in a static state of evolution. Nathan Davis discusses visceral disease as a cause of referred pain, particularly of the back. He considers each thoracic and abdominal viscus, and describes the type and location of the pain that may be referred by each diseased thoracic and abdominal viscus. The procedure for routine examination of the back is discussed by Ellis. This procedure is clearly described, step by step, with special reference to the anatomic structures involved. Later in the book he also discusses the relation of trauma to certain degenerative diseases and anomalies of the spinal column. This chapter has sixty-seven illustrations which include reproductions of roentgenograms, tracings from roentgenograms and various original diagrams. In it the normal and pathologic changes of the anatomy of the spinal column are described and the differential diagnosis of most of the diseases of the spinal column and sacrum and their joints is detailed. In the last chapter, Ellis also describes various forms of treatment of minor injuries of the back, including traction, manipulative surgery, operative treatment and physical therapy, with especial reference to the use of baking and massage.

Conwell discusses the management of fractures not involving the spinal cord, as based on his experience derived from the treatment of more than 200 patients suffering from spinal fracture. Injuries to the back accompanied by trauma to the spinal cord and peripheral nerves are described by Loyal Davis and Hale Haven. The diagnosis, immediate treatment and after care are all ably presented. Ghormley discusses in a short article the role of the articular facets in the production of low back pain, and he describes the pathologic changes of the anatomy, diagnosis and treatment of disease of the facets. In Osgood's contribution, body mechanics and posture are discussed, and Osgood indicates that faulty body mechanics may cause back pain as well as other associated conditions, some of which at first glance seem far removed from faulty posture. He concludes by making a plea "for more general and more constant consideration of the principles of body mechanics. We believe that such consideration and the establishment of good body mechanics may be expected not only to aid and hasten the recovery of those patients whose backs have already sustained injuries, but to exert a definite influence toward the prevention of disabling back pain. The important by-product will be better general health and enhanced well-being." The important keynotes of the book emphasize the importance of prevention, the thorough understanding and the adequate, conservative treatment of the injured back. The book is well illustrated, has an extensive bibliography at the end of each chapter and has a good index. It can be recommended highly to the physician faced with the problem of diagnosis and treatment of diseases of the spinal column, regardless of whether he is a specialist in orthopedics, neurosurgery or physical therapy, or a general practitioner who may be the first consulted concerning "low back pain" and related complaints.

SYNOPSIS OF DISEASES OF THE HEART AND ARTERIES. By *George R. Herrmann*, M.S., M.D., Ph.D., F.A.C.P., Professor of Medicine, University of Texas, Director of the Cardiovascular Service, John Sealy Hospital, Consultant in Vascular Diseases, U. S. Marine Hospital. Second Edition. Cloth. Pp. 468 with 91 illustrations and 3 color plates. Price $5.00. St. Louis: The C. V. Mosby Company, 1941.

The second edition of Herrmann's handy volume preserves all the comprehensiveness of the original volume, which served for many years as a textbook for lectures on cardiology to undergraduates and graduates. It offers a condensed and up-to-date presentation of the modern conceptions and principles in the practice of cardiology. The new ma-

terial includes a chapter on the examination methods for detection of cardiovascular disorders in military draftees, a chapter on added risk of cardiovascular disease for patients undergoing surgical or obstetrical management and a chapter on the timely subject of peripheral vascular disease. Thirty-three new illustrations have been added. This work should continue to serve as a practical aid to the busy practitioner and the hard-pressed students in the diagnosis and treatment of cardiovascular conditions.

SCHOOL HEALTH SERVICES. By *W. F. Walker*, Dr. P.H., and *Carolina R. Randolph*, M.P.H. Foreword by *W. Carter Williams*, M.D. Cloth. Pp. 204 with numerous graphs. Price, $1.50. New York: The Commonwealth Fund, 1941.

This small volume which represents a survey over a six-year span carried on jointly by the Tennessee Department of Public Health and the Commonwealth Fund of the school health program in Tennessee has been prepared to aid in the operation of school health programs. It covers the study of health services among 58,000 children. Some of the questions that are discussed are: Is there evidence that repeated medical examinations influence the extent of correction of physical defects? Is there evidence that nursing follow-up with or without repeated examinations influences the correction of physical defects? To what extent are the same defects recorded on repeated examinations without correction? Is there evidence that the presence of parents at the time of physical examination influences the correction of physical defects? Is there, at the time of first examination, any significant difference in physical condition between those children who have had pre-school supervision by the health department and those who have not? The volume carries a foreword by Dr. W. Carter Williams. Since more attention is being given to school health programs, this volume is recommended to all those whose activities are connected with the welfare of the children in our schools.

CONDITIONED REFLEXES AND PSYCHIATRY. By *Ivan Petrovitch Pavlov*, Late Director, Physiological Laboratories, Institute of Experimental Medicine and Academy of Sciences, Leningrad; Late Professor of Physiology, Military Medical Academy, Leningrad. Translated and Edited by *W. Horsley Gantt*, M.D., B.Sc., Associate in Psychiatry and Director, Pavlovian Laboratory, Johns Hopkins University. Cloth. Pp. 198 with 7 illustrations. Price, $4.00. New York: International Publishers, 1941.

The present volume is a sequel to "Lectures on Conditioned Reflexes" (International Publishers, 1928). The chapters in this volume are numbered continuously with those of the former. The translator, who spent five years in Pavlov's laboratory, has prefaced his translation by a thirty-five page introduction in which is portrayed the scientific life and methods of the great physiologist. In the introduction an effort has been made to evaluate Pavlov's conception of the relation of the conditioned reflex to clinical psychiatry. One gets an excellent idea of the scientific principles underlying his physiologic studies: his systematic planning, his methods of observation, his thoroughness, his respect for factual data, his humility, and his passion for his work. Here also is contained an account of his change of attitude toward the communist government. One is impressed that the translator in his introduction has not written an eulogy on Pavlov, but has endeavored to give an honest, intimate picture of the man and his work; it adds greatly to the value of the book. Pavlov entered the field of psychiatry at the age of 80 and all of the 16 lectures contained in the work were given after that age. At no time did he claim to be a clinician, he remained a physiologist. His endeavor was to explain certain clinical psychiatric manifestations by his physiologic observations on dogs in the laboratory. For readers who are not familiar with Pavlov's previous work on the conditioned reflexes, it is suggested that the last chapter entitled "The Conditioned Reflex" be read first. Having read this, the reader is better prepared to grasp the physiologic discussion of the first chapters. Of the 16 chapters, 11 are devoted to a physiologic discussion of the "higher nervous activity" which the author has attempted to elucidate by means of the conditioned reflex. The remaining chapters deal more directly with the application of the accumulated physiologic data to certain problems of clinical psychiatry. The human psychoses which Pavlov especially tried to explain by means of conditioned reflex study were schizophrenia, hysteria, obsessions and paranoia. This attempt has aroused the opposition of psychologists and psychiatrists and one of the most interesting chapters is the one entitled "Reply of a Physiologist to Psychologists." The chief point of adverse criticism of Pavlov's work is his attempt to fuse subjective with objective phenomena, or psychology with physiology. Pavlov maintained that "the psychologist, recently split off from the philosopher, has not yet altogether renounced partiality toward the philosophical method of deduction from pure logical work, without verifying every step of thought through agreement with actual fact. The physiologist proceeds in quite the opposite way. At every phase of his investigation he endeavors to analyze the phenomena individually and in connection with facts, determining as much as is possible of the conditions for their existence, not trusting to mere deduction or to simple hypothesis." An interesting feature of this work is Pavlov's description of the treatment of experimental neuroses in animals by the use of bromides. Although there is considerable repetition of material in the various lectures recorded, all is well worth the reader's time.

THE CARE OF THE PSYCHIATRIC PATIENT IN GENERAL HOSPITALS. By *Franklin G. Ebaugh*, Director, Colorado Psychopathic Hospital, Professor of Psychiatry, University of Colorado School of Medicine, Denver. Paper. Price, $1.00. Pp. 79. Chicago: American Hospital Association, 1940.

The author in this short monograph makes a convincing plea for the development of psychiatric

divisions in general hospitals. Several chapters are devoted to the organization of the psychiatric department as to personnel, administration, space, equipment, etc. A brief summary of the methods of study of such patients is included.

SPECIAL REPORT OF THE NEW YORK STATE COMMISSION TO FORMULATE A LONG RANGE HEALTH PROGRAM ON THE STATE WIDE HEALTH PREPAREDNESS CONFERENCE. SPONSORED BY THE NEW YORK DEFENSE COUNCIL AND HEALTH COMMISSION. LEGISLATIVE DOCUMENT No. 64. Cloth. Pp. 194. Albany, N. Y.: Fort Orange Press, 1941.

The volume includes the papers and addresses which were given at the special meeting of Health Preparedness Committee. They represent the present and future problems of the various medical and allied groups in the present emergency. An appendix of 50 pages lists the members of the committee in the different counties of New York state.

THE BIOLOGIC FUNDAMENTALS OF RADIATION THERAPY. By *Friedrich Ellinger*, M.D., Research Fellow, Radiotherapy Department, Montefiore Hospital, New York City; Formerly, Privatdozent in Radiology at the University of Berlin. Foreword by *Maurice Lenz*, M.D., Associate Clinical Professor of Radiology, Columbia University; Director of City Cancer Hospital; Chief of Radiotherapy Departments, Presbyterian Hospital and Montefiore Hospital, New York City. English translation by *Reuben Gross*, M.D., Formerly Resident Physician, Radiotherapy Department, Montefiore Hospital, New York City; First Lieut. M. C., U. S. A. Cloth. Pp. 360 with 79 illustrations. Price, $5.00. New York: Elsevier Publishing Company, Inc. Distributed by: Nordeman Publishing Company, Inc., 1941.

This English translation of a German monograph has the earmark of such excellency in balanced scholarship that it is frankly difficult to repress one's enthusiasm in order objectively to review its contents. The author, a son of a distinguished pharmacologist of the University of Frankfort a. Main, acknowledges the suggestions offered by the reviewer some years ago of his first edition (17:181, 1936) and has "attempted to make the best use of the advice given. Typographical errors and obsolete portions have been eliminated and the latter replaced by more data. A short paragraph concerning the action of neutrons has been added . . . the literature brought up to date . . . and special attention given to American and English sources." Of academic interest is that the work has been dedicated to his famous father whose inspiration, no doubt, was largely responsible for the rigid evaluation of this timely problem. Its quality and scope impressed themselves so favorably on one of our leading radiologists as to have him assert that its reading would benefit not only radiologists and physicists, but all clinicians and medical students. This praise in the foreword by Lenz is based on an impression that the American edition presents in didactic style a comprehensive and lucid review of the biologic and physiologic action of that form of energy designated as radiation, and that its scientific approach will have a beneficial influence in counteracting the pseudo-empiricism in modern physical therapy.

Throughout the text the author has attempted to demonstrate the values of the biologic fundamentals in radiation as basically equal in principle to those accepted for chemicals or drugs for therapeutic purpose. In order to emphasize this view, an endeavor has been made to divide the material and classify the exposition according to the teachings in vogue in pharmacologic texts. Thus physics and technics are discussed only as a means for the better understanding of the biological problems, similar to the style of exposition followed for example in the field of materia medica by expositors of that discipline. Within the space of 49 chapters subdivided into 5 sections, the pattern of exposition attempts to present a parallel picture of what might be interpreted as the pharmacology and toxicology of radiation. Within this scope the author reviews the nature and problems of experimental radiation under the detailed analysis of its physical, biological and cellular characteristics. The monograph discusses in concise style the therapeutic and pathologic effects of roentgen, gamma and radium radiation on the various organs of the body. It evaluates the action of cathode or corpuscular rays as well as its more modern counterpart, the neutrons. Sixteen chapters are similarly devoted to an appraisal of the nature and action of ultraviolet light, and a proportionate amount of space is devoted to a discussion of the biodynamic influence of visible light and certain of its component colors as well as to infrared radiation and to the elucidation of the physics of radiation and radiosensitivity. An impressive bibliography of 1100 contributions is appended. The translation is in the best of English, and is an achievement worthy of the classic character of this scholarly text.

PHYSICAL THERAPY ABSTRACTS

Demonstration That in Normal Man No Reserves of Blood Are Mobilized by Exercise, Epinephrine, and Hemorrhage. Richard V. Ebert, and Eugene A. Stead, Jr.

Am. J. Med. Sci. **201**:655 (May) 1941.

These authors give the following summary of their work. Exercise caused a decrease in plasma volume and an increase in hematocrit, hemoglobin and serum protein values in both normal and splenectomized subjects. For a given increase in protein concentration, the same increase in hematocrit reading occurred in both types of subjects. Epinephrine produced an increase in hemoglobin, hematocrit, and serum protein values in both normal and splenectomized subjects. In normal subjects attempts to demonstrate reserves of red cells or of plasma by removing large quantities of blood were unsuccessful. Pooling of blood in the extremities did not cause a demonstrable discharge of red cells in the circulation. A review of the literature shows that technical errors account for the large increases in blood volume which have been described in normal subjects after stimuli, as epinephrine or exercise, which increase the velocity of the circulation. Although there is abundant evidence that the spleen serves as a reservoir of red blood cells in the dog, cat and horse, the evidence presented indicates that blood reservoirs of this nature do not exist in normal human subjects.

Chronic Constipation. Sir Adolphe Abrahams.

Practitioner **146**:874 (April) 1941.

The author discusses physical methods of treatment. Cold applied to any part of the skin, particularly the skin of the abdomen, reflexly stimulates the muscular coat of the alimentary canal; and the more vigorous person, who can tolerate the morning cold bath, may find considerable help toward the production of the mass reflex which will be enhanced by the gastrocolic reflex following breakfast. Massage and the application of some form of electricity may have a similar effect, or they may act by suggestion in a susceptible subject. The author has not been impressed with their direct advantage, but believes harm can result.

As to exercise in general, the chief advantage appears to be that the adoption of this feature of regularity encourages an improvement in habits in general, and desirable conditioned reflexes, of which regular bowel action is one, may be acquired. How far the purely muscular side of exercise is beneficial is a matter of opinion. There is a tendency to recommend cycling and running and other forms of exercise in which the abdominal muscles are specifically employed. The intention is commendable, the expectation of benefit is plausible and benefit will accrue if there is a reflex effect on the intestinal musculature, since the voluntary abdominal musculature cannot have much to do with intestinal action or defecation.

Convulsive Phenomena Produced by a New Method of Remote Excitation. Frederick A. Fender.

Arch. Neurol. & Psychiat. **45**:617 (April) 1941.

A report based on a series of 125 experiments on 50 dogs in which electrical stimulation was carried out by remote excitation is presented. In each instance the stimulating electrode was placed below the cortex. The subject in each instance was intact, unanesthetized and, except when experimental conditions demanded certain alternations, normal. The object of the experiments was to observe the convulsions thus produced.

Effects of Training and of Gelatin Upon Certain Factors Which Limit Muscular Work. S. Robinson, and P. M. Harmon. With the Technical Assistance of E. S. Turrell, and F. O. Mackel.

Am. J. Physiol. **133**:161 (May) 1941.

Nine nonathletic men were trained for running during a period of twenty-six weeks. Six of them took 60 Gm. of gelatin a day from the ninth through the fifteenth week of training and 3 took the same amount of gelatin from the fifteenth through the twenty-first week. Changes associated with training were: (*a*), consistent improvement in timed races on the track; an average increase of 16 per cent in the maximal oxygen consumption during exhausting work; (*b*), an increase in the lactic acid mechanism for contracting an oxygen debt; (*c*), an improvement of 8 per cent in efficiency of running, and (*d*), a slight increase in the excretion of creatinine during the first part of the training period. The training had no effect on the basal metabolism and caused only a slight rise of efficiency in grade walking. None of the functions mentioned were affected by taking gelatin. Neither the "alactacid oxygen debt" nor the lactice acid mechanism was affected by taking gelatin.

A Convulsion During Non-Convulsive Faradic Shock Therapy. Gerald Caplan.

Brit. M. J. (March 29) 1941.

Following on the promising results obtained by Berkwitz, of Minneapolis (1940), an investigation is being carried out on the therapeutic effect of nonconvulsive faradic shock treatment in mental disease. This method is reputed to give as good results as the ordinary cardiazol or electrical convulsive therapy without the dangers consequent on the convulsions — namely, fractures of verte-

brae, lesions of the brain and abscesses of the lung — reports of which are becoming ever more frequent.

A case of acute mania successfully treated by this method is described.

An account is given of how the patient became increasingly sensitized to the faradic current until eventually a small current produced a major convulsion.

Effect of Body Temperature on Pancreatic Secretion. S. L. Osborne, and Harry Greengard.

Am. J. Physiol. **133**:404 (June 1) 1941.

The established therapeutic use of artificial fever and the more recent trials of artificially induced subnormal temperatures have made pertinent an investigation of the effect of these procedures on the secretions of the body fluids. Therefore the alterations in pancreatic secretion produced by these means have been studied. Anesthetized dogs were given secretin at a constant rate in order to elicit a continuous and regular secretion. In one series of animals the body temperature was raised by means of short wave diathermy, and in a second series it was lowered by immersion of the animals in a bath through which cold water was circulated. Raising the body temperature resulted in an increased flow of pancreatic juice up to seven times the original rate, and lowering of the temperature operated to cause complete cessation of secretion. These observations are probably accounted for on the basis of alterations in circulation through the pancreas.

Electrical Anesthesia With Constant Currents. M. L. Silver, and R. W. Gerard.

Am. J. Physiol. **133**:447 (June 1) 1941.

An uninterrupted direct current passed between nonpolarizable electrodes placed in the mouth and anus of frog, rat or dog can produce and maintain a state of immobility and unresponsiveness to stimulation. To effect this electrical anesthesia the current is increased gradually, to avoid stimulation; or, especially in dogs, the electrodes are placed and the current is initiated under preliminary light chemical anesthesia (evipan, 30 milligrams per Kg).

A current of 3 milliamperes in the frog, 12 milliamperes in the rat and 45 milliamperes in the dog suffices to maintain the inactive state indefinitely — as long as eight hours in one dog. To terminate anesthesia the current is decreased gradually or even reversed for a short time to hasten emergence. Recovery seems complete in the frog within a minute, in the rat within ten minutes and in the dog in one hundred minutes, although its reflexes return in fifteen minutes. Animals after as many as eight anesthetic periods of several hours each have shown no physiologic injury, or histologic changes in the spinal cord (rat and frog).

During induction of electrical anesthesia in the dog, crossed extension, flexion and knee jerk reflexes briefly increase and then disappear in that order. The blood pressure and heart rate are not significantly altered by the anesthesia, respiration may deepen after it.

The reflex block is due to central action, since spinal root irritability is normal during electronarcosis while motoneuron thresholds, tested with microelectrodes, are raised. Only the current passing through the spinal cord, therefore, is effective. The resistance of dog and electrodes is nearly 500 ohms, and some 20 volts must be applied to produce the 45 milliamperes. The current in the cord averages 1.4 per cent of the total in the dog. Assuming a comparable ratio in the other animals and allowing for differences in cord cross section, in each species a current density of about 1 milliampere per square millimelt of cord cross section produces inactivity.

The distribution of current flow in body structures was measured by the IR drop between variously placed electrodes; and the influence of anesthetizing electrode positions on current flow through the cord was similarly studied. With polarizing needle electrodes in the cisterna and lumbar space spinal anesthesia results without suppressing head responses.

Effects of Exercise, Rest and Sleep on Scalp Potential. W. T. Burge, and M. J. Vaught.

Am. J. Physiol. **133**:232 (June 1) 1941.

When one nonpolarizable electrode was placed on the scalp of the forehead and another on the forearm a current of low amperage passed from the scalp to the forearm. This current increased with physical activity and decreased with rest.

The current was weakest during sleep, around 0.01 microamperes. When the subject awoke it increased to around 0.05 microamperes. On getting up the current increased still further, how much depended on how active the subject became.

Stoking the furnace and removing the ashes increased the current from the low resting level of 0.07 to 0.15 microampere. Climbing four flights of stairs hurriedly increased it to 0.20 microampere. Five floor dips increased it to 0.425 microampere, ten floor dips to 0.625 microampere, and fifteen floor dips increased the current to 0.70 microampere. Two minutes after the floor dips the current decreased to 0.275 microampere; after four minutes, to 0.175 microampere; after six minutes, to 0.10 microampere, and eight minutes, to 0.10 microampere, and after ten minutes of rest the current had decreased to its original low level of 0.075 microampere. Various kinds of exercises and sports such as football, tennis, baseball, bowling, basket ball, handball, boxing, volley ball, skating, badminton, tap dancing, soccer and wrestling increased the current to a greater or less degree, depending on the strenuousness of the activity. Exhaustive exercise decreased the current.

Exposure to cold not sufficient to produce shivering increased the current to 0.25 microampere. A cold shower bath for two minutes increased it to 0.30 microampere. A hot shower for two minutes increased it to 0.35 microampere.

When a goldfish was placed in water between two platinum disk electrodes with a galvanometer in the circuit a current of low amperage passed from the electrode near the head of the fish to the one near its tail, thus showing the head of the fish to be positive and the tail negative. When the fish became active in swimming the strength of the current increased, as during exercise, in the human. When the fish became quiet the current decreased, as during rest, in the human.

A Study of the Clinical Manifestations and the Results of Treatment of Twenty-Two Patients With Raynaud's Symptoms. Carl A. Johnson.

Surg., Gynec. & Obst. **72**:889 (May) 1941.

The management of Raynaud's syndrome varies with circumstances as determined from each individual case but may follow certain broad principles, as follows: (1) No treatment necessary. In a group of patients (5 in this series), no definite etiology was found, the symptoms were mild, and the Raynaud's syndrome showed no evidence of progression after many years; (2) The treatment of associated diseases. It is important to treat associated conditions or diseases, particularly secondary anemia and syphilis. The secondary anemia obviously involves the treatment of the cause of the anemia if it can be found; (3) Local treatment involves instructions to the patient to avoid whatever brings on the attacks. Paraffin baths give considerable relief to some patients.

The results of a study of *22* patients with Raynaud's syndrome are presented with the following opinions:

1. Observations on this series of patients confirm Hutchinson's statement made more than 50 years ago that what is known as Raynaud's disease is not a clinical entity, and that the peripheral manifestations observed are merely symptoms of some more fundamental disease. 2. The vascular changes during a Raynaud's attack are not necessarily due to an active vascular constriction, but may be the results of a vasodilatation in the palmar arch with a diversion of blood from the fingers and a passive collapse of the vessels. 3. Surgery of the sympathetic nervous system was a therapeutic failure but medical management gave considerable relief to a number of patients.

Effect on Pulse Rate of Peripheral Arterial Occlusion and Release. D. V. Dauber; H. Weinberg, and M. Landowne.

Am. J. Physiol. **133**:256 (June 1) 1941.

The effect on pulse rate of applying and releasing occluding cuffs to the lower extremities was observed in 27 normal persons and 4 subjects with thromboangiitis obliterans. Fifty-seven tests, each involving two or more occlusions, were performed with the subjects horizontal. Pulse rates were measured from electrocardiographic records. A rapid interruption of the arterial inflow was effected by connecting wide cuffs placed around the proximal thighs to a pressure tank at over 200 mm. of mercury. The immediate return of flow was assured by disconnecting the pressure tank and opening the cuff tube.

In about half of the cases, application of the occluding pressure was followed by a slowing in pulse rate of 4 to 20 beats per minute (average 9), developing 1 to 3 seconds after occlusion and lasting 5 to 16 seconds. During the period of occlusion, no significant changes in pulse rate occurred. On release of the occluding pressure, a pulse acceleration of 15 to 30 beats per minute was noted in 97 per cent of the subjects, lasting one-sixth to three minutes. This acceleration commenced one to three seconds after release, reaching its maximum in four to five seconds. The extent and duration of the pulse acceleration varied directly with the length of prior occlusion. No rise in pulse rate occurred on release of arterial occlusion in the four patients with thromboangiitis obliterans.

A fall in arterial blood pressure was observed to follow release of the arterial occlusion; and in 7 subjects studied by direct needle puncture of the brachial artery with a Hamilton manometer, the blood pressure fall was observed to be instantaneous and the pulse contour changed as expected with a lowering of peripheral resistance. The blood pressure dropped from 12 to 35 mm. systolic and from 14 to 27 mm. diastolic. An instantaneous, transient rise in blood pressure occurred on application of the occlusion in the five cases studied with the same technic.

It is concluded from the time at which the blood pressure and pulse rate change occurred that the pulse acceleration on release of peripheral arterial occlusion is a reflex response to the drop in blood pressure, and that the latter results from the lowering of the peripheral resistance by reopening the leg vascular channels. The failure of patients with narrowing of the peripheral vessels to develop a similar pulse acceleration would favor this interpretation.

Physical Activity and Fatigue in Relation to Health. The Value of Physical Education to Nurses. E. Stanley Ryerson.

Canad. Hospital **18**:13 (May) 1941.

The author stated: "I hope the day will come when trained physical educators will be appointed to the staffs of training schools for nurses to give instruction and act as leaders in the recreational activities that should form an essential part of such an educational programme."

Effect of Exercise on Ketone Body Metabolism. D. R. Drury, and A. N. Wick.

Am. J. Physiol. **133**:257 (June 1) 1941.

Changes in ketone body concentration in the blood, and in output in the urine as a result of exercise were followed in the human subject. Ketosis was produced by having the subject take a constant ketogenic diet for several days. The blood ketone body concentration became definitely lower as a result of a twenty minute period of moderate running, but in the rest period fol-

lowing its concentration came back to the pre-exercise level within an hour. After three hours of exercise the blood ketone concentration was not diminished. These observations support the view that ketone bodies are used as source of energy in muscular activity and that the production of these substances by the liver is increased by exercise.

Tuberculosis of the Tongue. H. P. Schugt.

Laryngoscope **51**:284 (March) 1941.

Very small ulcerations often respond to local medical treatment with high concentrations of silver nitrate, lactic acid and trichloracetic acid. Gentian violet has proved to be effective in all kinds of tuberculous lesions of the oral cavity and the larynx. It destroys the always present mixed infection in the diseased tissue and thus actually relieves the pain and greatly contributes to the further healing of the ulceration. These local measures can be combined with ultraviolet radiations (Kromayer lamp), applied directly to the lesion. Isolated ulcerations in patients with negative sputum, with a more benign pulmonary focus and good general resistance may be surgically excised or cauterized with the hot platinum needle, as is commonly done in laryngeal tuberculosis. Complete cures have been observed in such smaller lesions. Some authors, however, warn against surgical excision because of the danger of spreading the infection into the surrounding tissues. The more superficial ulcerations also respond to application of carbon dioxide ("dry ice").

Tuberculosis of the Upper Respiratory Tract. Review of the Literature of the Past Two Years. George B. Wood.

Arch. Otolaryng. **33**:861 (May) 1941.

Dierichs for two years had tried out galvanization of the tuberculous larynx for the relief of pain according to the method of Grain. He encountered some complications, such as burning of the skin and glottic cramp, which caused him to modify the technic; the modification, though slightly decreasing the efficiency, made the treatment absolutely harmless. The electrodes he used were thinner, so that they fitted more easily into the curvature of the patient's neck, and were held in place by adhesive straps. The electrical dosage was regulated rather by the patient's sensations than by a milliamperemeter. The strength of the current was gradually raised until the patient felt a "fine prickling." This was followed by a sense of constriction, and occasionally there was salivation and a metallic taste. The duration of the first sitting was only twenty to thirty minutes, but the time was increased to one hour in subsequent treatments. While the functional results were rather surprising in that the patient could eat again and was practically free from pain, the author did not consider that the treatments were in any way curative.

Cotton-Cornwall has also used ionization, or electrical anesthesia, which he claimed is the best method for relief of pain. He said that it is simple and without danger if ordinary care is taken and completely effective in most cases. He used a 45 volt dry battery equipped with a current controller made of a reducing coil and with a milliamperemeter. He covered the electrode with lint at least one-third inch (0.85 cm.) thick, and the negative pole was wet with a 2 per cent solution of potassium iodide. The lint on the positive pole was moistened with pure water. He began his treatment with 4 to 5 milliamperes, which was gradually increased, but except in rare cases he never went above 9 milliamperes. The applications were made daily for one-half hour until the resulting anesthesia lasted for at least twenty four hours. After this, the applications were given only when there was a recurrence of pain.

Corsets and Backache. Frank R. Ober.

J. A. M. A. **116**:1909 (April 26) 1941.

Reynolds and Lovett made their observations over a period of years before publishing the results of their study. These fundamental principles are as true today as they were thirty years ago.

A corset which does not fit the patient properly will not help a lame back; on the contrary, such a garment may increase backache.

A corsetier's job is much like that of a sailmaker's. If the sails are not cut correctly, they do not draw right and hence the boat will not sail as fast as it should. There is a real art to cutting sails, and the same is true in the cutting of cloth for corsets.

The functions of a corset are to restrict motion, to afford protection and to restore balance. Any back support which does not accomplish these three things will not do much toward relieving a backache.

The following requirements are essential in applying a corset: 1. It should be long enough in front to support and to lift the abdomen. 2. It should follow the curves of the back snugly; that is, the back steels of the corset must be bent so that this occurs. 3. It should be long enough behind to give a good hold over the buttocks, and it should not quite reach the inferior angles of the scapulas. 4. It should not be tight around the waist in front. 5. The most important feature of any corset is the way it fits over the iliac crests. Few corset makers realize how essential it is to secure this requirement. It is here that the knowledge and art of the corset maker will be revealed. Unless the corset maker learns to do this, the corset will not be a success. The cloth of this part of the corset must be so cut that the crest of the ilium fits into a sort of pocket. If this is not done, then the corset will slide up or roll backward over the crests and therefore will be useless. 6. If a corset is effective it will produce changes in the patient's posture. For this reason it is necessary to inspect the corset from time to time and make any necessary alterations to meet these changes. 7. A back-lace corset is more easily adjusted than the solid back

garment. 8. Corsets which are constructed with sacral pads inside or extra belts outside are examples of lack of knowledge on the part of the corsetier in the correct construction of a corset. 9. Any corset or belt which encircles the pelvis as if it were in a vise is an undesirable piece of apparatus, because pressure usually does not relieve a lame back. 10. Finally, when the backache and its associated symptoms have disappeared, physical therapy measures to restore the patient's own corset muscles, which are the abdominal and the gluteus maximus muscles, should be prescribed, and, when these muscles are strong enough to perform their functions, the corset may be omitted.

The Quantity of Irradiated Non-Virulent Rabies Virus Required to Immunize Mice and Dogs. L. T. Webster, and J. Casals.

J. Exper. Med. 73:601 (May 1) 1941.

In a previous paper the authors pointed out that 1.5 cc. of irradiated tissue culture virus successfully immunizes mice against a subsequent intracerebral or intramuscular test infection. It soon developed, however, that extremely large volumes of the irradiated culture virus were needed to immunize dogs. Quantitative studies were undertaken, therefore, to determine the amounts of vaccine necessary for mice and dogs in terms of mouse intracerebral lethal doses. From a practical viewpoint, culture virus has not yet proved a satisfactory source of rabies vaccine, due chiefly to its low content of virus. To immunize, approximately 1 cc. is required for mice and 500 cc. for dogs,—about 5 per cent of the body weight. The supernatant of centrifuged brain tissue virus, however, has proved a good source of vaccine. The virus content of infected brain tissue per unit volume is 1,000 times that of tissue culture. A 10 per cent emulsion can be centrifuged to sediment a large portion of the tissue fragments without lowering the titre of the virus. The supernatant from a 1 to 5 per cent emulsion can be irradiated so as to destroy virulence without loss of immunizing potency. One tenth cc. of such a preparation immunizes mice adequately,—0.5 per cent of the body weight.

Altogether the results of these experiments to date suggest that basically the immunizing potency of a vaccine is dependent upon virus content, that is, that the immunizing antigen is the virus particle. They indicate also that one intracerebral lethal mouse dose of a given strain of virus from tissue culture is equivalent in immunizing potency to one dose of the same strain from infected mammalian brain. Finally, the findings point to a relation between number of mouse lethal doses required to immunize and body weight. The 1 per cent irradiated dog brain virus has proved an effective and practical vaccine for immunizing mice, and equal or superior to chloroformized vaccine. It is now being tested in dogs with promising results. In the experiments described, we found with respect to tissue culture rabies virus that 1 cc., which contains approximately 50,000 mouse intracerebral lethal doses, properly irradiated, was required to immunize a mouse; 500 cc., which contain 25,000,000 doses, were required to immunize a 20 pound beagle dog. Tissue culture virus concentrated ten times proved capable of immunizing mice in a dose one-tenth as large as that required for unconcentrated culture virus. Brain virus suspensions were centrifuged so as to remove a large part of the tissue particles without striking loss in the virulence of the supernatant. The centrifuged supernatants of 1 to 5 per cent brain virus suspensions were irradiated so as to destroy virulence and yet retain immunizing potency. Irradiated supernatants of mouse brain virus proved capable of immunizing mice as well as or better than similar supernatants treated with chloroform.

One tenth cc. of a 1 per cent irradiated dog brain virus containing approximately 50,000 mouse intracerebral lethal doses immunized mice effectively.

The Influence of Temperature on the Internal Secretory Activity of Transplanted Ovaries in the Male Rat. A. K. Lampton, and A. J. Miller.

J. Urol. 45:552 (April) 1941.

The effect of temperature on the internal secretory activity of transplanted ovaries was investigated by grafting ovaries into the ears of castrated male rats, some of which were kept in a warm environment (33 C.), others in a cool environment (22 C.), and by studying these animals for (1) excretion of urinary androgens, (2) histologic and physiologic changes in the prostate and seminal vesicles and (3) castration changes in the pituitary gland.

That transplanted ovaries which are kept warm by a high environmental temperature secrete less androgenic substance than do those kept cool by a low environmental temperature is shown by the diminished urinary androgens, more severe atrophy in the prostate and seminal vesicles, more negative ejaculation tests and the presence of castration cells in more of the pituitary glands of the animals of the former group.

Early Physical Therapy in the Treatment of Fractures of the Surgical Neck of the Humerus. George J. Garceau, and Shirley Cogland.

J. Indiana M. A. 34:293 (June) 1941.

In the management of fractures of the surgical neck of the humerus, physical therapy has as its major objective the restoration of function simultaneous with the healing of the fracture and at a rate of progress compatible with it. Due to the wide range of individual differences, it is impossible to plan a rigid program and follow it exactly. In general the treatment follows this plan, with variations made at the discretion of the doctor.

During the first week following fracture, no treatment of any sort is given. The arm remains immobilized in sling and swathe which are not removed. At the beginning of the second week, the sling and swathe are removed and treatment

is begun. The sling is reapplied after each treatment, but the swathe is no longer necessary for adequate support. At the beginning of the third week following injury, assisted active exercise is substituted for passive exercise, through the same range of motion. Assistance with the exercises is reduced gradually until by the fourth week active exercise against gravity may be attempted in the sitting or standing position. Abduction and flexion are first obtained by creeping up the wall with the finger tips, permitting a greater range of motion than is possible unassisted.

As soon as the patient is able to do an exercise unassisted and without substitution of scapular motion for motion in the shoulder joint, he is permitted to attempt it at home, usually during the fourth week. Rate of progress is determined by the absence of pain or spasm. No force is applied at any time and all activity is kept within the limit of pain.

Cold Allergy and Cold Pathergy. Erich Urbach; Max F. Herrman, and Philip M. Gottlieb.

Arch. Dermat. & Syph. **43**:366 (Feb.) 1941.

On the basis of the entire pertinent literature and of the investigations of the authors (50 cases studied by one of the authors during the past fifteen years and previously reported in part), they believe that hypersensitiveness to physical agents can be based on any of the following types of sensitization mechanisms: 1. Primary physical allergy. Physical agents, such as cold, heat, light and pressure, can become operative on the basis of specific antigen-antibody reactions. 2. Secondary physical allergy. Physical agents can cause production of secondary antigens in tissues. The organism may become hypersensitive to these autoantigens. 3. Histamine effect. Under given pathologic conditions the tissue's own protein can undergo alteration, and, under the influence of physical agents, this altered protein produces a histamine-like substance which elicits, for instance, cutaneous manifestations. 4. Cold "pathergy." Predisposing factors, such as previous infections and other diseases, can bring about a certain degree of instability in the peripheral neurovascular system. Physical agents thus are enabled locally to elicit abnormal neurovascular reactions. 5. Disturbances of the temperature-regulating mechanism. Central disturbances in the temperature-regulating mechanism, due to previous infectious diseases, attacks of fever or other pathologic processes, may be assumed to be responsible for the pathologic reactions in the blood vessels of the skin in certain cases.

To achieve clarity and coherence in the nomenclature of the various forms of hypersensitiveness and hyposensitiveness, the author suggests the concept of "pathergy" to embrace all the subordinate varieties of abnormal sensitiveness.

Hypersensitiveness to cold can be brought on in a variety of ways: (*a*) allergically, with the physical agent acting as antigen, (*b*) by autoantigens produced in tissues under the influence of physical forces, (*c*) by histamine-like substances released in the tissues under the influence of physical irritation, (*d*) often and unquestionably, as the expression of an underlying vasomotor neuropathy and (*e*) occasionally, perhaps, by disturbances in the central temperature-regulating mechanism. Special emphasis is placed on the fact that this variety of possible etiologic factors is of importance in the consideration of treatment.

Seventeen cases of urticaria due to cold air and occurring in a family of 28 members within four generations are reported. The need for a clear differentiation between allergic and nonallergic hypersensitiveness is emphasized. The concept of "pathergy" is introduced to facilitate this differentiation.

Perineal Repair With Cotton and Postoperative Sitz Baths. A. P. Hudgins.

West Virginia M. J. **37**:309 (July) 1941.

Faced with the problem of a contaminated perineal field, the author reports good results when he used cotton sutures for repair followed by sitz baths.

The sitz baths were started the following day after delivery, or the third or fourth day of postoperative cases when the abdomen has been entered. The sitz bath according to the author consists, ideally, of a movable, chair-tub which may be brought into the patient's room with water at tolerance heat, adding hot water when it can be borne. To this is added coarse salt (barrel salt, or ice cream salt), four or five cups full to two gallons or more of water. The patient may get this treatment for twenty or thirty minutes once or twice a day. If the special chair-tub is not available, the patient may be wheeled to the bath tub and treatment taken there.

The theory of the sitz bath is to place the patient in a hot, hypertonic saline solution which, by osmotic action as well as the simple cleansing effect, gets the serum and old blood clots out of the wound.

Theoretically, there are many objections to this method; first, the possibility of infecting the wound by bathing the fresh wound and the rectum in the same solution. However, the wounds did not become infected (perhaps due to the concentration of the salt solution). The temperatures in the trial group showed less elevation than in the control group. The second objection is the possibility of extension of infection up into the pelvis. This did not occur. The water in the sitz bath was only about two inches deep. The third objection — possible disruptions of the wound. The final healing was more satisfactory in this group than in the control group when the factors were comparable.

In this series the sitz baths in hypertonic salt solution caused the skin on the thighs to be slightly dry and scaly. The coarse salt was found to work better than regular table salt because the more pure form of sodium chloride was found to cause less irritation than the salt which contained other chemicals (magnesium carbonate in a few cases) to make it "flow" easily.